Vol. 998 Number 1

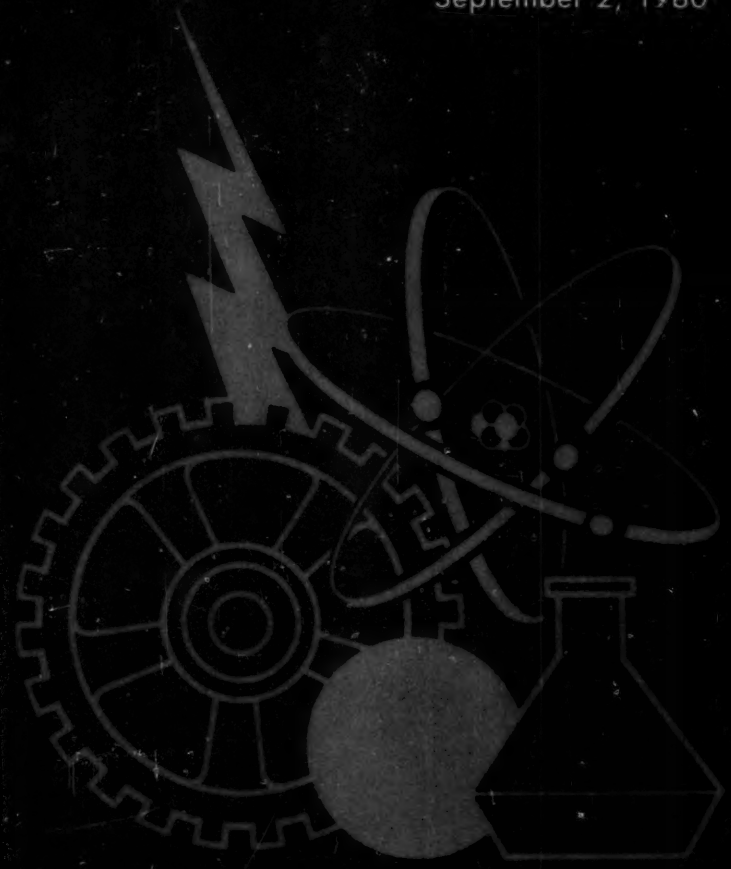
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 2, 1980



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

September 2, 1980 Volume 998 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

June 17, 1980.

Board of Appeals Decisions Rendered in the Month of July 1980

Affirmed	181
Affirmed in part	29
Reversed	65
Total	275

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,553,334, Re. S.N. 161,229, Filed Jun. 20, 1980, Cl. 84/1.03, AUTOMATIC MUSICAL RHYTHM SYSTEM WITH OPTIONAL PLAYER CONTROL, Alfred B. Freeman, Owner of Record: *Norlin Music, Inc., Chicago, Ill.,* Attorney or Agent: George B. Newitt, et al., Ex. Gp.: 217

3,650,332, Re. S.N. 161,862, Filed Jun. 23, 1980, Cl. 172/22, SOIL CORING APPARATUS ASSEMBLY, Arnold A. Dedoes, Owner of Record: *Inventor,* Attorney or Agent: Ernest I. Gifford, et al., Ex. Gp.: 352

4,035,569, Re. S.N. 160,226, Filed Jun. 17, 1980, Cl. 536/32, PREPARATION OF CELLULOSE NITRITE, Richard G. Schweiger, Owner of Record: *Inventor,* Attorney or Agent: Mario A. Martella, et al., Ex. Gp.: 125

4,095,608, Re. S.N. 161,122, Filed Jun. 19, 1980, Cl. 133/8 R, PLASTIC COIN HOLDER, Gordon W. Holmes, Owner of Record: *Professional Packaging Limited, Mississauga, Ontario, Canada,* Attorney or Agent: Peter W. McBurney, et al., Ex. Gp.: 311

4,141,746, Re. S.N. 160,430, Filed Jun. 17, 1980, Cl. 106/169, CELLULOSE SULFATE ESTERS, Richard G. Schweiger, Owner of Record: *Inventor,* Attorney or Agent: Mario A. Martella, et al., Ex. Gp.: 142

4,156,331, Re. S.N. 161,791, Filed Jun. 23, 1980, Cl. 52/115, MULTI-SECTION TELESCOPIC BOOM, Robert J. Lester, et al., Owner of Record: *Coles Cranes Ltd., Sunderland, England,* Attorney or Agent: Stephen S. Townsend, et al., Ex. Gp.: 354

4,162,357, Re. S.N. 160,882, Filed Jun. 19, 1980, Cl. 528/67, PROCESS FOR THE PRODUCTION OF SYNTHETIC RESINS CONTAINING ISOCYANURATE GROUPS, Rolf Kubens, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Gene Harsh, et al., Ex. Gp.: 143

PATENT NOTICES

Certificates of Correction for the Week of Sept. 2, 1980

3,910,724	4,191,837	4,199,965	4,205,703
4,030,158	4,192,440	4,200,752	4,205,806
4,098,700	4,192,869	4,200,903	4,206,105
4,100,318	4,193,553	4,200,994	4,206,261
4,109,945	4,194,734	4,201,896	4,206,512
4,150,565	4,195,002	4,201,919	4,206,672
4,152,303	4,195,383	4,201,976	4,207,316
4,152,923	4,195,698	4,202,413	4,207,891
4,159,385	4,196,664	4,202,463	4,208,398
4,160,456	4,197,415	4,202,465	4,208,439
4,173,494	4,197,490	4,202,674	4,208,509
4,177,079	4,198,022	4,202,757	4,208,519
4,177,936	4,198,154	4,202,769	4,208,916
4,187,081	4,198,241	4,203,265	4,208,973
4,188,279	4,198,285	4,203,298	4,209,048
4,190,547	4,198,337	4,203,391	4,209,280
4,191,044	4,198,342	4,203,498	4,209,462
4,191,271	4,198,493	4,203,991	4,210,182
4,191,348	4,199,121	4,204,216	4,210,409
4,191,377	4,199,432	4,204,893	4,210,489
4,191,544	4,199,476	4,205,342	4,210,706
			4,210,863

Errata

All reference to Patent No. 4,188,384 to Chikao Yoshikumi, et al. of Japan, for NITROGEN-CONTAINING POLYSACCHARIDE FOR PROMOTING DRUG-SENSITIVITY OF BACTERIA RESISTANT TO ANTIBIOTICS appearing in the OFFICIAL GAZETTE of Feb. 12, 1980, should be deleted since no patent was granted.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–079,566. 'Neisseria Gonorrhoeae' Vaccine. Filed Sept. 27, 1979.

Patent application 6–098,845. Aziridinyl Quinone Antitumor Agents. Filed Nov. 30, 1979.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–034,104. Thrust Augumented Spin Recovery Device. Filed Apr. 27, 1979.

Patent application 6–043,943. Automatic Thermal Switch. –Filed May 30, 1979.

Patent application 6–060,434. Process for the Preparation of New Elastomeric Polytriazines. Filed July 25, 1980.

Patent application 6–061,555. Catalyst Surfaces for the Chromous/Chromic Redox Couple. Filed July 27, 1979.

Patent application 6–065,676. Frequency-Scanning Particle Size Spectrometer. Filed Aug. 10, 1979.

Patent application 6–076,635. Internal Combustion Engine With Electrostatic Discharging Fuels. Filed Sept. 18, 1979.

Patent application 6–092,141. Tackifier for Addition Polyimides. Filed Nov. 7, 1979.

Patent application 6–092,170. Thermal Barrier Seal. Filed Mar. 10, 1980.

Patent application 6–096,255. Gas Path Seal. Filed Nov. 20, 1979.

Patent application 6–102,001. Laser Measuring System for Incremental Assemblies. Filed Dec. 7, 1979.

Patent application 6–102,002. Rim Inertial Measuring System. Filed Dec. 7, 1979.

Patent application 6–102,004. Circumferential Shaft Seal. Filed Dec. 7, 1979.

Patent application 6–103,836. Improved Tire/Wheel Concept. Filed Dec. 12, 1979.

Patent application 6–106,136. Liquid-Immersible Electrostatic Ultrasonic Transducer. Filed Dec. 21, 1979.

Patent application 6–106,190. Liquid Metal Slip Ring. Filed Dec. 21, 1979.

Patent application 6–108,107. Moving Body Velocity Arresting Line. Filed Dec. 28, 1979.

Patent application 6–111,439. A Fluorescent Radiation Converter. Filed Jan. 11, 1980.

Patent application 6–113,017. Flared Tube Attach System. Filed Jan. 18, 1980.

Patent application 6–119,339. High Power Metallic Halide Laser. Filed Feb. 7, 1980.

Patent application 6–119,340. Method of and Means for Retarding Dye Fading During Archival Storage of Developed Color Photographic Film. Filed Feb. 7, 1980.

Patent 4,178,100. Distributed-Switch Dicke Radiometers. Filed Mar. 29, 1978. Patented Dec. 11, 1979. Not available NTIS.

Patent 4,182,156. Static Pressure Orifice System Testing Method and Apparatus. Filed Aug. 17, 1978. Patented Jan. 8, 1980. Not available NTIS.

Patent 4,183,217. Pressure Limiting Propellant Actuating System. Filed Aug. 4, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,072. Solar Cell Angular Position Transducer. Filed Feb. 9, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,111. Driver for Solar Cell I–V Characteristic Plots. Filed July 26, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,149. Air Speed and Attitude Probe. Filed May 30, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,155. Radar Target for Remotely Sensing Hydrological Phenomena. Filed Sept. 22, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,327. Method and Apparatus for Rapid Thrust Increases in a Turbofan Engine. Filed Dec. 9, 1977. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,184,368. Oceanic Wave Measurement System. Filed Oct. 16, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,184,472. Method and Apparatus for Slicing Crystals. Filed May 15, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,184,491. Intra-Ocular Pressure Normalization Technique and Equipment. Filed Aug. 31, 1977. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,184,609. Cryogenic Container Compound Suspension Strap. Filed Aug. 22, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,184,903. Method of Fabricating a Photovoltaic Module of a Substantially Transparent Construction. Filed July 26, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,164. Voltage Feed Through Apparatus Having Reduced Partial Discharge. Filed Jan. 10, 1978. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,185,493. Viscosity Measuring Instrument. Filed June 23, 1978. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,186,347. Radio Frequency Arraying Method for Receivers. Filed Oct. 31, 1978. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,186,749. Induction Powered Biological Radiosonde. Filed May 12, 1977. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,394. High-Speed Data Link for Moderate Distances and Noisy Environments. Filed Apr. 25, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,416. High Power RF Coaxial Switch. Filed Oct. 10, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,470. Dielectric-Loaded Waveguide Circulator for Cryogenically Cooled and Cascaded Maser Waveguide Structures. Filed Feb. 9, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,506. Microwave Power Transmission Beam Safety System. Filed Oct. 16, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,188,368. Method of Producing Silicon. Filed Mar. 29, 1978. Patented Feb. 12, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va .22217

Patent application 638,885. Test Connector. Filed Dec. 8, 1975.

Patent application 674,206. A Valve for Independently Throttling a Plurality of Hydraulic Lines. Filed Apr. 6, 1976.

Patent application 674,254. Meltable Bifunctional Quinoxaline Monomer and Preparation of a Polymer Therefrom. Filed Apr. 6, 1976.

Patent application 684,527. Film-Recording Noise Dosimeter. Filed May 10, 1976.

Patent application 708,236. A Novel Method for the Production of Hydrogen-Carbon Monoxide Mixtures. Filed July 23, 1976.

Patent application 708,505. An Underwater Connector. Filed July 30, 1976.

Patent application 712,128. Fabrication of Ablator Liners in Combustors. Filed Aug. 5, 1976.

Patent application 712,417. Polymeric-Coated HMX Crystals for Use With Propellant Materials. Filed Aug. 6, 1976.

Patent application 716,481. Reinforced Filament-Wound Cut-Port Pressure Vessel and Method of Making Same. Filed Aug. 20, 1976.

Patent application 716,729. Preparation of Ceramics. Filed Aug. 23, 1976.

Patent application 720,175. 7-Amino Coumarin Dyes for Flashlamp-Pumped Dye Lasers. Filed Sept. 3, 1976.

Patent application 723,001. A Sliding-Tone Command Receiver System. Filed Sept. 13, 1976.

Patent application 723,696. Coating Composition and Method for Improving Propellant Tear Strength. Filed Sept. 16, 1976.

Patent application 741,904. Short Pulse Solid State-Magnetic Modulator for Magnetron Transmitter. Filed Nov. 15, 1976.

Patent application 745,931. Multi Element Tubular Reference Electrode (M.E.T.R.E.). Filed Nov. 29, 1976.

Patent application 752,571. Method for Fabricating Ferroelectric Ultrasonic Transducers. Filed Dec. 20, 1976.

Patent application 752,641. Apparatus for Performing a Discrete Cosine Transform of an Input Signal. Filed Dec. 20, 1976.

Patent application 753,140. Motion Compensating Liquid Holding Tank. Filed Dec. 20, 1976.

Patent application 757,819. Inductive Communication System. Filed Jan. 10, 1977.

Patent application 762,707. Ion-Implanted Barriers for Reducing Alkali Ion Drift in Thin Film Insulators. Filed Jan. 26, 1977.

Patent application 764,482. Method of Making Tuned Resonance Passive Electronic Filters. Filed Jan. 31, 1977.

Patent application 767,424. Growth of Epitaxial Layers From a Liquid Phase. Filed Feb. 10, 1977.

Patent application 770,330. Digital Bypassable Register Interface. Filed Feb. 22, 1977.

Patent application 770,863. Optical Switch. Fi'ed Feb. 22, 1977.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–132,583. Vacuum-Operated Produce Handling Systems. Filed Mar. 21, 1980.

Patent application 6–132,597. Mushroom-Growing Medium. Filed Mar. 21, 1980.

Patent application 824,777. Preparation of Protein Concentrates From Whey and Seed Products. Filed Aug. 15, 1977.

Patent 4,194,998. Highly Absorbent Polyhydroxy Polymer Graft Copolymers Without Saponification. Filed Oct. 30, 1978. Patented Mar. 25, 1980. Not available NTIS.

Patent 4,195,519. Measurement of Water Flow Rate. Filed Aug. 31, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,195,695. Land Imprinter. Filed Dec. 30, 1977. Patented Apr. 1, 1980. Not available NTIS.

NATIONAL BUREAU OF STANDARDS

Patent Advisor' Office, Room A–419, Administration Bldg. Washington, D.C. 20234

Patent application 893,340. Method and Apparatus for Measuring Gas Flow Speed. Filed Apr. 11, 1978.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 948,266. Subthreshold Neutron Interrogator for Detection of Radioactive Materials. Filed Oct. 3, 1978.

Patent application 954,679. Compact, Maintainable 80–KeV Neutral Beam Module. Filed Oct. 25, 1978.

Patent application 957,618. Device for Measuring the Fluid Density of a Two-Phase Mixture. Filed Nov. 30, 1978.

Patent application 961,153. Automatic Sweep Circuit. Filed Nov. 16, 1978.

Patent application 963,654. Annular Flow Diverter Valve. Filed Nov. 24, 1978.

Patent application 963,655. Crossed-Field Diverter for a Plasma Device. Filed Nov. 24, 1978.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW.
Washington, D.C. 20590

Patent application 6–135,370. Combination Absolute and Differential Temperature System. Filed Mar. 31, 1980.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6–085,416. Method of Synthesizing Chlorozotocin. Filed Oct. 16, 1979.

Patent application 6–104,983. High Resolution Electron Microscope Cold Stage. Filed Mar. 4, 1980.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent 4,181,892. Sweeping Noise Blanker. Filed May 12, 1978. Patented Jan. 1, 1980. Not available NTIS.

Patent 4,185,273. Data Rate Adaptive Control Device for Manchester Code Decoders. Filed July 27, 1977. Patented Jan. 22, 1980. Not available NTIS.

Patent 4,186,373. System for Measuring In Situ Acoustic Energy Properties of Ocean Floor Soils. Filed May 22, 1978. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,187,698. Coupling for Misaligned Shafts. Filed June 12, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,188,120. Radioiodine Detector Based on Laser Induced Fluorescence. Filed Jan. 6, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,188,172. Method and Means for Injecting Hot Liquid When Pumping Cold Liquid. Filed May 24, 1978. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,189,268. Diver-Controlled Underwater Linear Milling Machine. Filed May 24, 1978. Patented Feb. 19, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale Patent Library*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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New Jersey	Newark Public Library	(201) 733-7740
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
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North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
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Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 26, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	6-6-80
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions: Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-4-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	6-5-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-25-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	8-17-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 330—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-25-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	6-2-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-7-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Foot wear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,995,572 to 3,999,836, inclusive
Plant Patents ..... Numbers 2,269 to 2,270, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED SEPTEMBER 2, 1980

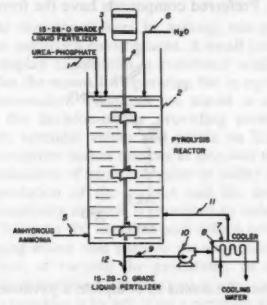
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T998,001
PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA PHOSPHATE

John M. Stinson, Sheffield, and James R. Burnell, Killen, both of Ala., assignors to Tennessee Valley Authority

Filed Aug. 31, 1979, Ser. No. 71,436
Int. Cl.[3] C05B *13/00*; C05C *9/00*
U.S. Cl. 71—29
3 Sheets Drawing. 33 Pages Specification



BATCH PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA-PHOSPHATE

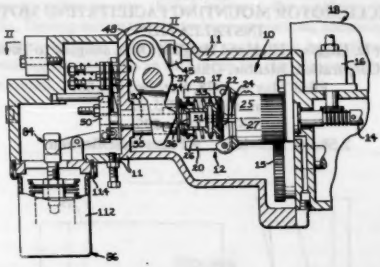
A batch process is disclosed for the production of relatively pure urea ammonium polyphosphate liquid fertilizers from crystalline urea phosphate made from wet-process acid and urea. Initially, crystalline urea phosphate is fed to a tank where it is combined with previously produced liquid product; the latter is added to provide fluidity for agitation. The mixture is then ammoniated batchwise in one stage to pyrolyze the urea phosphate to condense orthophosphate to polyphosphate and form molten urea-ammonium polyphosphates. Pyrolysis takes place at relatively low temperatures of 220° F. to 300° F. and heat from ammoniation of the urea phosphate crystals provides all the heat to effect the condensation. The molten pyrolyzate which contains mixtures of urea, ammonium orthophosphate, and ammonium polyphosphate is dissolved in an ammonia-water mixture to yield high-analysis liquid fertilizer that contains 10 to 15 percent nitrogen and 16 to 30 percent P_2O_5; 10 to 50 percent of the phosphate is present as polyphosphate. The liquid fertilizer is then cooled. Supplementary micronutrient-containing materials may be incorporated in the liquid product. Total batch cycle time varies from about 20 to 45 minutes.

T998,002
GOVERNOR DUAL POWER SETTING SELECTION CONTROL

Robert H. Miller, Peoria, and James C. Smith, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 19, 1979, Ser. No. 86,557
Int. Cl.[3] F02D *1/04*
U.S. Cl. 123—357
3 Sheets Drawing. 13 Pages Specification

A governor for an engine has a fuel supply control mechanism with linearly adjustable yieldable stops that are positionable in at least two discrete positions by selectively actuated first and second coacting adjusting wedges. The cam-like wedges are disposed operatively adjacent the linearly adjustable stops and are slideably repositioned relative to one another when responding to the vehicle speed/direction control. Adjustment



or repositioning of the wedges places the fuel control adjustable stops selectively in one of the two discrete positions to control the lug characteristic, torque rise and/or basic operating speed of the engine.

T998,003
APPARATUS FOR CLAMPING SHEETS OF VARIABLE LENGTH ONTO A ROTATING DRUM

Donald L. Jackson, Nicholasville, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 920,307, Jun. 28, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,866
Int. Cl.[3] B41F *21/04*; B41J *13/22, 11/04*
U.S. Cl. 101—411
2 Sheets Drawing. 15 Pages Specification

In a printing mechanism, the leading edge of a sheet of paper is fed onto the printing surface of a cylindrical drum and is clamped thereto. A gear is rotatively attached to the drum, and a sensor controlled gear segment clutch, which is mounted for rotation independently of the drum, controls the clamping and rotational movement of a clamp for clamping the trailing edge of the sheet of paper. The sensor senses when the trailing edge of the sheet passes thereby and activates the gear segment clutch which rotates toward the gear attached to the drum and engages it. The rotational movement of the gear segment clutch results in the closing of the trailing edge clamp onto the trailing end of the sheet of paper. The gear attached to the

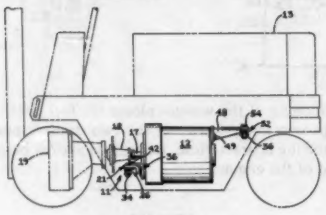
drum rotates the gear segment clutch and it in turn rotates the trailing edge paper clamp which now rotates the drum. Consequently, the above described printing mechanism can clamp both ends of variable length paper onto a cylinder and rotate it for a print operation.

T998,004

VEHICLE MOTOR MOUNTING FACILITATING MOTOR INSTALLATION

Robert D. Higgins, Highland Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed May 8, 1978, Ser. No. 904,087
Int. Cl.[2] B60K *5/02*
U.S. Cl. 180—299
2 Sheets Drawing. 9 Pages Specification



A motor mounting assembly is separable into two portions between the frame and the motor enabling one portion of the mounting assembly to remain resiliently connected to the vehicle frame while the other portion is removed with the motor. Reinstallation of the motor is greatly simplified as the separable portions of the mounting assembly can readily be repositioned and reconnected without the misalignment problems encountered during installation of motors using conventional mounts which must be engaged at the vehicle frame.

T998,005

DESENSITIZED BENZOYL PEROXIDE COMPOSITIONS

Edward F. Orwoll, Langhorne, Pa., and Richard R. Boettcher, North Muskegon, Mich., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 15, 1979, Ser. No. 20,677
Int. Cl.[3] C11D *3/395*; C07C *179/10*; C11D *7/54*
U.S. Cl. 252—186
No Drawing. 10 Pages Specification

Provided are stabilized compositions of benzoyl peroxide and a method for their preparation.

The compositions comprise benzoyl peroxide and a desensitizer selected from the group consisting of a lower alkyl ester of 3,3-dimethyl-4-pentenoic acid and a lower alkyl ester of 4,6,6,6-tetrachloro-3,3-dimethylhexanoic acid, the desensitizer being present in an amount of at least 0.5 part by weight for each part by weight of benzoyl peroxide.

T998,006

NONDIFFUSIVE COMPOUNDS COMPRISED OF A SENSITIZING DYE MOIETY AND AN IMAGE DYE MOIETY JOINED BY A RADIATION CLEVABLE LINKAGE

John D. Mee, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 12,171, Feb. 14, 1979. This application Aug. 8, 1979, Ser. No. 64,693
Int. Cl.[3] C07C *29/00, 43/00, 46/00*
U.S. Cl. 260—156
No Drawing. 30 Pages Specification

Radiation-cleavable nondiffusible compounds for providing a transfer dye image are comprised of a spectral sensitizing dye moiety and a diffusible image dye moiety joined by a linkage in the spectral sensitizing dye moiety which is cleaved upon absorption of radiation by the spectral sensitizing dye moiety, thereby releasing a diffusible image dye. Such compounds are useful in radiation-sensitive elements and processes to provide dye images. Preferred compounds have the formula

where:

Q represents the atoms to complete a pyridine or quinoline ring;

SENS is attached to the **2** or **4** position of the pyridine or quinoline ring and represents the atoms which, in conjunction with N, complete a spectral sensitizing dye;

ALK represents an alkylene moiety of **1** to **8** carbon atoms;

DYE represents a diffusible photographic dye or dye precursor moiety; and

$X^{\ominus}$ represents an anion, if necessary to provide charge neutrality.

T998,007

PHENYLSULFAMOYL COUPLERS

Harland J. Osborn; Robert G. Cameron, and Edward J. Walsh, all c/o Kodak Park Division, Rochester, N.Y. 14650

Division of Ser. No. 56,587, Jul. 11, 1979, and a continuation-in-part of Ser. No. 928,741, Jul. 27, 1978, abandoned. This application Dec. 14, 1979, Ser. No. 103,810
Int. Cl.[3] C07C *143/80*
U.S. Cl. 260—556 B
11 Sheets Drawing. 53 Pages Specification

Ballasted primary and secondary 3'-sulfamoyl-1-hydroxy-2-naphthanilide couplers are disclosed as well as compositions and photographic elements containing these couplers in coupler solvent particles. The coupler solvent particles are comprised of a combination of a coupler solvent and the coupler capable of permitting the formation of a microcrystalline dye. Surprisingly these microcrystalline dyes exhibit a broadened absorption characteristic in the 750 to 850 mm region of the spectrum. Dye images having such absorption characteristics are particularly suited to forming integral infrared absorbing sound tracks in photographic elements, such as motion picture projection films.

T998,008

COMPUTER SYSTEM AND METHOD FOR DECISION TREE ANALYSIS

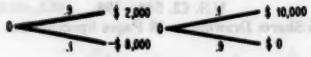
Ralph B. DeLano, Jr., Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 537,305, Dec. 30, 1974, abandoned, which is a continuation of Ser. No. 397,555, Sep. 14, 1973, abandoned, which is a continuation of Ser. No. 174,100, Aug. 23, 1971, abandoned. This application Oct. 30, 1978, Ser. No. 955,823

Int. Cl.[2] G06F *15/20*

U.S. Cl. 364—412

14 Sheets Drawing. 171 Pages Specification



A tool to aid decision-makers in making non-programmed decisions in an uncertain environment. A small computer having graphic display capabilities is combined with a program which provides the means for operating the computer directly by the decision-maker. Problems are stated in decision-tree format with the decision-maker providing probabilities for chance events, terminal values and points on his preference curve. The computer makes choices at decision nodes on the basis of maximization of expected value or utility and displays both the expectation of the project and the decision path. Automated sensitivity analysis is provided to determine those probabilities lying on the decision path which are most sensitive in changing either that path or the expectation. In addition, the effects of varying the probability of any selected branch may be determined. Instructions appear on the display and the user's response is by selecting a program alternate with the light pen or typing a numeral. All results are given on the display.

T998,009

HANDLING DEVICES

Ronald Bevan, "Whitehaven", 76 Hay St., Steeple Morden, Royston, Hertfordshire, United Kingdom

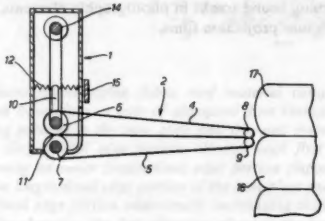
Filed Jul. 24, 1979, Ser. No. 60,124

Claims priority, application United Kingdom, Oct. 27, 1978, 42270/78; Jun. 28, 1979, 22512/79

Int. Cl.[3] B65G *57/09, 57/16*

U.S. Cl. 414—77

1 Sheets Drawing. 11 Pages Specification



In a machine for stacking or destacking sacks filled with particulate materials, a device for handling the sacks is disclosed which comprises a body portion from which extends a platform having upper and lower surfaces provided by two belts placed back to back and driveable in opposite directions so that the outer surfaces move in the same direction. When the extended edge of the platform is positioned between a sack of one layer and its underlying layer, i.e. so that the sack rests on the upper belt and the lower belt of the platform rests on the underlying layer, the platform may be drawn into or out from the interface between the sack and its underlying layer by driving the belts in the appropriate directions. The body portion is secured to a robot arm for moving and positioning the handling device, movement of which is preferably sychronized with movement of the platform into or out from the interface so as to minimize any sliding between the platform and the sacks. During automatic destacking operations, location of the interface between two layers of sacks may be facilitated by mounting the platform so that it can tilt slightly away from the horizontal.

T998,010

PROCESS FOR REMOVAL OF SULFUR DIOXIDE FROM GASES

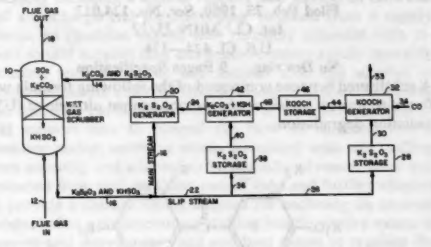
Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Continuation of Ser. No. 966,685, Dec. 5, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,742

Int. Cl.[3] C01B *17/00*

U.S. Cl. 423—242

1 Sheets Drawing. 19 Pages Specification



An improvement is provided in the regeneration system of agueous regenerative processes for the removal of SO_2 from SO_2-containing gas streams which have a scrubbing system containing (1) a scrubbing zone through which a recirculating stream of sodium, potassium or ammonium thiosulfate solution continuously passes as a vehicle for the SO_2 absorbent—sodium, potassium, or ammonium carbonate—under conditions favorable to the formation of sulfite by the reaction of carbonate and SO_2 and (2) a thiosulfate generation zone in which the sulfite is converted by sulfide to thiosulfate. The improvement comprises converting in a regenerating system, the net make of thiosulfate to sulfide and carbonate by converting one portion of the thiosulfate to formate and the reacting the other portion with said formate.

T998,011

Patent Not Issued For This Number

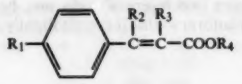
T998,012

PROTECTION OF INSECT PHEROMONES FROM DEGRADATION BY ULTRAVIOLET RADIATION

William A. Bruce; Patrick T. M. Lum; Helen C. F. Su; Roy E. Bry, and Robert Davis, all of Savannah, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 25, 1980, Ser. No. 124,011
Int. Cl.[3] A01N *25/22*
U.S. Cl. 424—174
No Drawing. 9 Pages Specification

A substituted benzene compound of the following formula was found to protect an insect pheromone against ultraviolet (UV) radiation degradation



wherein R_1 is H or alkoxy group of 1 to 2 carbon atoms, R_2 is H or phenyl group, R_3 is H, CN, or methylcarboxy group, R_4 is alkyl group of 1 to 2 carbon atoms of straight chain or 2 to 6 carbon atoms with β-substitution of alkyl or alkoxy group of 1 to 2 carbon atoms or α- and β-OH substitutions. The UV absorbing compounds of the preceding formula significantly extended the biological activity and quality of the pheromone while at the same time remaining nontoxic to the insect and nondestructive of the environment.

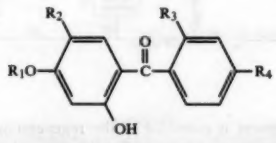
T998,013

PROTECTION OF INSECT PHEROMONES FROM DEGRADATION BY ULTRAVIOLET RADIATION

William A. Bruce; Patrick T. M. Lum; Helen C. F. Su; Roy E. Bry, and Robert Davis, all of Savannah, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 25, 1980, Ser. No. 124,012
Int. Cl.[3] A01N *25/22*
U.S. Cl. 424—174
No Drawing. 9 Pages Specification

A substituted benzene compound of the following formula was found to protect an insect pheromone against ultraviolet (UV) radiation degradation



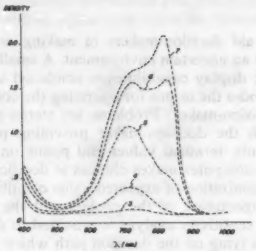
wherein R_1 is H or alkoxy group of 1 to 12 carbon atoms, R_2 is H, sulphonic acid or its sodium salt, R_3 is H, OH, and R_4 H, OH, or methoxy group. The UV absorbing compounds of the preceding formula significantly extended the biological activity and quality of the pheromone while at the same time remaining nontoxic to the insect and nondestructive of the environment.

T998,014

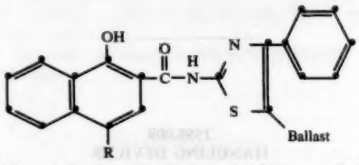
THIOAZOLYL COUPLERS, COUPLER COMPOSITIONS AND PHOTOGRAPHIC ELEMENTS SUITED TO FORMING INTEGRAL SOUND TRACKS

Samuel J. Ciurca, Jr., Rochester; Robert G. Cameron, Spencerport, and Edward J. Walsh, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 928,621, Jul. 27, 1978, Pat. No. 4,178,183.
This application Mar. 19, 1979, Ser. No. 21,754
Int. Cl.[3] C07D *277/38*
U.S. Cl. 548—195
4 Sheets Drawing. 38 Pages Specification



Ballasted 1-hydroxy-2-naphthamide couplers which are N-substituted with a thiazolyl group that is in turn substituted with a phenyl group are disclosed as well as compositions and photographic elements containing these couplers in coupler solvents. Preferred couplers are those of the formula



wherein R is a coupling-off group and Ballast is a hydrophobic photographic ballasting group. The coupler solvent particles are comprised of a combination of a coupler solvent and the coupler capable of permitting the formation of a microcrystalline dye. Surprisingly these microcrystalline dyes exhibit a broadened absorption characteristic in the 750 to 850 nm region of the spectrum. Dye images having such absorption characteristics are particularly suited to forming integral infrared absorbing sound tracks in photographic elements, such as motion picture projection films.

REISSUES

SEPTEMBER 2, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,388

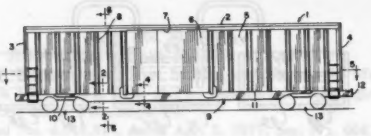
RAILROAD CAR WITH DEPRESSED FLOOR

William D. Mundinger, Canfield, Ohio, and Richard C. Snyder, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Original No. 3,885,506, dated May 27, 1975, Ser. No. 458,741, Apr. 8, 1974. Application for reissue May 17, 1978, Ser. No. 906,799

Int. Cl.[2] B61D *17/00, 17/10;* B61F *1/12*

U.S. Cl. 410—139 **19 Claims**



1. A railroad car for high cubic capacity interior design including a recessed floor construction and comprising:

a pair of *generally L-shaped* side sills, *each having an upright portion and a horizontal portion*

a center sill structure spaced between the side sills,

said floor construction including a floor structure having a pair of recessed floor units *having lateral and outer ends,* one on either side of and extending substantially below the top of the center sill structure and [inwardly] *having its outer lateral end supported on the horizontal portion* of a respective side sill, [and]

said floor structure having a longitudinal recess portion *with inner and outer sides* between each floor unit and [its] *the upright portion of an* adjacent side sill and a removable filler within said recess portion.

Re. 30,389

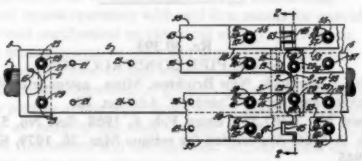
CLAMPING APPARATUS

Vernon S. Oase, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Original No. 4,079,480, dated Mar. 21, 1978, Ser. No. 792,072, Apr. 28, 1977. Application for reissue Jun. 23, 1978, Ser. No. 918,738

Int. Cl.[2] E05D *13/02*

U.S. Cl. 16—87 R **21 Claims**



9. Means for clamping fabric roof material comprising an elongated base plate, a pair of elongated first clamping plates extending parallel to the base plate and disposed respectively on opposite longitudinal edge portions thereof, each first clamping plate having an inner longitudinal edge portion disposed on the respective longitudinal edge portion of the base plate and an outer longitudinal edge portion transversely overhanging the base plate, means for clamping the first clamping plates to the base plate, a pair of elongated second clamping plates extending parallel to the first clamping plates and disposed respectively on the overhanging longitudinal edge portions of the first clamping plates, and means for clamping the second clamping plates to the first clamping plates to clamp fabric roof material therebetween.

Re. 30,390

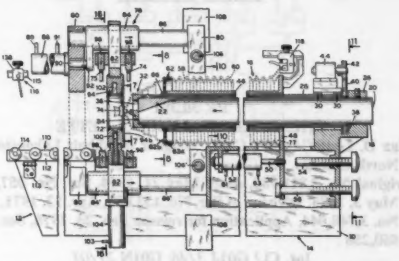
STUFFING APPARATUS

Vytautas Kupcikevicius, Chicago, and Anton L. Mika, Downers Grove, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Original No. 4,044,426, dated Aug. 30, 1977, Ser. No. 627,252, Oct. 30, 1975. Application for reissue Sep. 1, 1978, Ser. No. 939,137

Int. Cl.[2] A22C *11/02*

U.S. Cl. 17—49 **57 Claims**



1. An apparatus for controlling the uniformity of stuffed diameter and conformation of the terminal ends of an encased product comprising in combination, a frame; a stuffing horn assembly including a central support tube having an inlet end and a discharge end for conveying emulsion from a supply source, an emulsion cut-off tube rotatably mounted with respect to said support tube and a sleeve means axially movably mounted with respect to said support tube and adapted to mount and secure a shirred tubular casing on said sleeve means, and emulsion cut-off means disposed at the discharge end of said support tube to control the flow of emulsion into a mounted casing; snubbing means associated with said stuffing horn assembly and adapted to be partially advanced over and retracted from said emulsion cut-off tube and further adapted to provide a closure means adapted for enclosing an encased product after a predetermined stuffing length; motive means to operate said sleeve means and snubbing means to regulate the position of said snubbing means over said emulsion cut-off tube and the position of said sleeve means relative to said snubbing means; and control means operatively associated with said stuffing horn assembly and said snubbing means to selectively control a cycle of successive stuffing and closing operations, thereby producing a stuffed closed encased product of predetermined length and diameter with controlled shape of the leading and trailing ends of said product.

50. A method for controlling the uniformity of stuffed diameter and conformation of the terminal ends of an encased product which comprises:

(a) positioning a closed end shirred tubular casing article containing a sizing means and having a leading end unshirred portion of casing length secured by a closure, onto a movably mounted support sleeve of a stuffing horn assembly;

(b) moving said support sleeve and sizing means to deshirr a predetermined length of casing at the beginning of a first cycle and for successive cycles;

(c) introducing a pressurized emulsion through a support tube into said deshirred portion of shirred tubular casing article;

(d) returning said sizing means and deshirred casing length to impose a predetermined tension on said casing length to

provide a controlled shape leading end of said encased product;

(e) continuing the stuffing of said casing with emulsion after formation of said shaped leading end by continually feeding emulsion into said casing while regulating the diameter by passing the casing length over said sizing means and through an annular ring to provide a snubbing force;

(f) controlling the shape of the trailing end of the stuffed encased product by advancing and retracting said sizing means to deshirr a predetermined length of casing and impose a predetermined sizing tension on said casing length to provide a controlled shaped trailing end of said product; and,

(g) gathering said trailing end and applying a trailing end closure thereto, thereby providing a stuffed encased product.

Re. 30,391

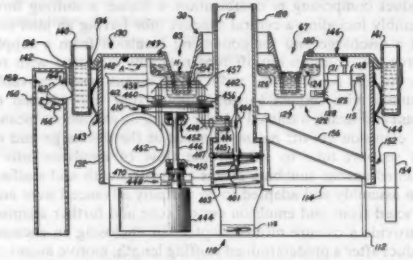
CHEMICAL ANALYSIS CUVETTE

Max D. Liston, Irvine, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Original No. 3,811,780, dated May 21, 1974, Ser. No. 357,063, May 3, 1973. Division of Ser. No. 133,081, Apr. 12, 1971, Pat. No. 3,748,044. Application for reissue Feb. 23, 1976, Ser. No. 660,258

Int. Cl.³ G01J *3/46;* G01N *21/03*

U.S. Cl. 356—409 **33 Claims**



1. In a chemical analyzer, an improved cuvette comprising:

integrally formed means for defining individual compartments adapted to hold specimens, said compartments being arranged to pass through a line defining a closed curve having a central axis; [and]

window means *associated with each compartment comprising opposed planar members that are parallel to each other* for transmitting radiant energy through at least some portions of the compartments, whereby the specimens may be analyzed;

ventilation means for defining an opening within said curve for allowing the passage of air; and

additional analyzing apparatus comprising:

a source of radiant energy located within the area bounded by a vertical projection of said line defining a closed curve;

rotation means for rotating the cuvette in relationship to the radiant energy source, whereby the radiant energy sequentially passes through the window means in each of said compartments; and

means for passing air over the source and through said opening, whereby the source is cooled.

Re. 30,392

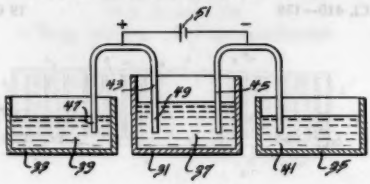
WICK-AND-POOL ELECTRODES FOR ELECTROCHEMICAL CELL

Michael F. Roche, Downers Grove, Ill.; Suzan M. Faist, Haddonfield, N.J.; James G. Eberhart, and Laurids E. Ross, both of Naperville, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Original No. 4,065,602, dated Dec. 27, 1977, Ser. No. 780,722, Mar. 24, 1977. Application for reissue Sep. 7, 1978, Ser. No. 940,042

Int. Cl.² H01M *10/39*

U.S. Cl. 429—72 **5 Claims**



10. In a liquid-metal electrode system for providing electrode reactant consisting of liquid lithium alloy with about 10 weight percent copper into a negative electrode within a secondary electrochemical cell also including a positive electrode containing FeS as a reactant, scid system comprising a cell structure containing a volume of liquid alkali-metal halide electrolyte, a reservoir containing said lithium-copper alloy, an austenitic stainless steel wick having a first portion of its length in contact with said liquid lithium-copper alloy within said reservoir and having a second portion of its length opposite to said first portion, submerged within said volume of electrolyte to serve as said negative electrode, said wick having sufficiently more attraction for said liquid lithium-copper alloy than for said electrolyte to draw said liquid lithium-copper alloy into said second portion submerged within said electrolyte, the improvement wherein said austenitic stainless steel wick throughout its first and second portions consists of a plurality of screen layers pleated so as to have a plurality of longitudinal V-shaped channels alternating with longitudinal V-shaped ridges across the width of the screen layers, said channels having greater depth than width to effectively retain lithium-copper alloy within said first portion as a reservoir and within said second portion as the negative electrode, said first portion of said wick extending above the upper surface and outside the volume of said first electrolyte.

Re. 30,393

PLASTIC PIPE CONSTRUCTION

Charles J. Sherlock, New Brighton, Minn., assignor to Western Packing and Supply Company, Addison, Ill.

Original No. 3,367,370, dated Feb. 6, 1968, Ser. No. 526,225, Feb. 9, 1966. Application for reissue Mar. 26, 1979, Ser. No. 23,945

Int. Cl.³ F16L *55/00, 11/12*

U.S. Cl. 174—37 **1 Claim**

1. In a construction comprising a transmission system for the movement of materials under ground including plastic pipe

having a resinous plastic body for carrying said materials, said pipe being buried in the ground whereby the location of the pipe cannot be determined by visual inspection, the improvement comprising metallic material of relatively high electrical conductivity secured to the pipe body, said electrically conductive material being secured along substantially the entire length of said body whereby the electrically conductive material will be automatically buried in association with the pipe body as the pipe is placed in the ground, and whereby detecting means suitable for sensing the presence of the electrically conductive material can be employed for locating the pipe from above ground.

Re. 30,394

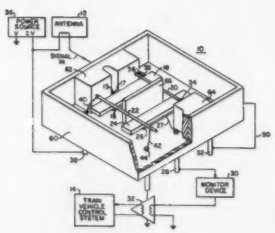
SIGNAL BANDPASS FILTER APPARATUS

Arun P. Sahasrabudhe, West Mifflin, and Thomas C. Matty, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 4,016,517, dated Apr. 5, 1977, Ser. No. 604,740, Aug. 14, 1975. Application for reissue Apr. 4, 1978, Ser. No. 893,212

Int. Cl.[2] H03H *9/02, 9/04;* G08B *29/00*

U.S. Cl. 333—189 **9 Claims**



1. In a signal bandpass filter apparatus operative with an input signal having a predetermined frequency and a load device, the combination of:

first means responsive to said input signal for providing a first electrical to mechanical energy conversion;

second means operative with said first means for providing a second mechanical to electrical energy conversion;

third means operative with said second means for providing an output signal to said load device; and

fourth means connected to [supply a direct current] *control the passage of said input signal to said load device and including an integrity checking* voltage signal *provided* through said first means and through said second means for determining the operational integrity of said apparatus by disabling the passage of said input signal to said load device when a predetermined failure of said apparatus occurs *with said integrity checking voltage signal being different than said input signal.*

Re. 30,395

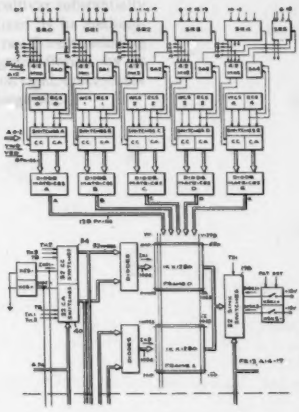
2½D CORE MEMORY

Kurt O. Wright, Burbank, and Thomas J. Gilligan, Rolling Hills Estates, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Original No. 4,096,583, dated Jun. 20, 1978, Ser. No. 732,928, Oct. 15, 1976. Application for reissue Jan. 15, 1979, Ser. No. 3,718

Int. Cl.[2] G11C *11/00*

U.S. Cl. 365—130 **43 Claims**



15. A *2-wire* core memory *with balanced read and write disturbed delta noise along each digit-sense conductor* comprising a plurality of memory cores which are bidirectionally switchable between two different states of magnetization in response to coincident switching currents inductively coupled thereto, a plurality of conductors *including a plurality of digit-sense conductors and a plurality of X conductors orthogonal thereto, the conductors being* arranged to inductively couple current therein to a plurality of memory cores to control the switching of a core in response to the coincidence of current in [at least] two conductors, and current control circuitry coupled to control the current in the plurality of conductors *during a memory cycle* to provide [a first current in a first conductor which remains continually energized while second and third currents are sequentially initiated in different second and third conductors respectively, each of the currents in the second and third conductors being coincident with the current in the first conductor to provide coincident switching current inductively coupled to sequentially switch at least two cores] *selective switching of the memory cores between different states of magnetization, the current control circuitry operating during each memory cycle to provide current in at least two different X conductors with the last currents in the selected X conductors during a memory cycle occurring in opposite read/write polarity pairs such that at the end of a memory cycle half of the last currents in X conductors selected during the memory cycle inductively couple a core along any given digit-sense conductor with a read polarity and half of the last currents in X conductors selected during the memory cycle inductively couple a core along the given digit-sense conductor with a write polarity.*

PLANT PATENTS

GRANTED SEPTEMBER 2, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,590

RED CHRYSANTHEMUM NAMED CHIEFTAIN

Leonard H. Shoesmith, Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed Mar. 5, 1979, Ser. No. 17,408

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its medium-large composite flowers having dark red ray florets radiating from a disc having bright yellow and green florets, by its profuse production of open blooms borne on rigid, erect stems, and by its abundant foliage of relatively large size.

PLANT PATENTS

GRANTED SEPTEMBER 2, 1980

Directions for plant patent are similar to color and therefore X is not practicable to reproduce the drawing.

4,059

DEO CERYSANTHEMUM NAMED CHEYENNE

Lenard H. Bloomquist, Visalia, Richard Ampuja, Jr. Porterville, and Ampuja Plant Company, West Chester, all of Calif.

Filed Mar. 8, 1979, Ser. No. 17,459

Int. Cl. A01H 5/00

U.S. Cl. PP4—74 1 Claim

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its medium, large composite flowers having dark red ray florets reflexing from a disc having bright yellow and green florets, by its peculiar pyrethrum type of open bloom form on rigid, erect stems, and by its abundant foliage of medium light green.

PATENTS

GRANTED SEP. 2, 1980

ERRATA

For CLASS	See PATENT NO.
128–214 G	4,219,912
368–066	4,219,999
474–207	4,210,052
440–053	4,210,111
272–067	4,210,334
430–387	4,210,470
430–532	4,210,471
548–215	4,210,589
556–434	4,210,600
568–401	4,210,604
568–432	4,210,605
370–024	4,210,816
370–110	4,210,821
370–085	4,210,822
455–182	4,210,922
455–295	4,210,923
364–900	4,211,003

PATENTS

GRANTED SEP. 2, 1980

ERRATA

PATENTS

GRANTED SEPTEMBER 2, 1980

GENERAL AND MECHANICAL

4,219,892

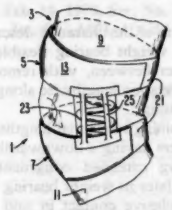
KNEE BRACE FOR PREVENTING INJURY FROM LATERAL IMPACT

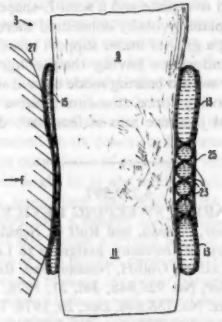
Robert W. Rigdon, 6318 142nd St. SW., Edmonds, Wash. 98020

Filed Feb. 5, 1979, Ser. No. 9,528

Int. Cl.² A41D *13/06*

U.S. Cl. 2—24 **11 Claims**





1. A device for preventing accidental dislocation of the joint between a pair of limbs of the human body as a result of a blow to said joint or limbs, comprising: a first means to circumferentially frictionally engage a first one of said limbs about a region thereof adjacent said joint, a second means to circumferentially frictionally engage the other of said limbs about a region thereof adjacent said joint, a flexible substantially inextensible member extending from said first means to said second means across said joint, said flexible inextensible member being connected to each of said means to engage and, interposed between said flexible inextensible member and said joint, a first means responsive to the force of impact of a blow to the region of said joint generally on the side opposite said flexible inextensible member, to expand and create compressive force between said joint and said flexible inextensible member, to contract upon subsidence of said force of impact and to thereby brace said joint against movement under the influence of said blow, said means responsive to said force of impact and said flexible member permitting unhindered flexure of said joint in the absence of said blow.

4,219,893

PROSTHETIC KNEE JOINT

Douglas G. Noiles, New Canaan, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 605,208, Aug. 15, 1975, abandoned. This application Sep. 1, 1977, Ser. No. 831,095

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.911 **35 Claims**

35. A prosthetic joint for surgical implant to link two bones in a human or animal body comprising a first component including fixation means for affixing said first component to one of said bones, a second component including a stem of circular cross section, coupling means for rotatably coupling said first and second components for rotation about an axis at right angle to said stem, and a third component including a fixation means for affixing said third component to the other of said bones, said third component including means for matingly engaging said second component and for accommodating said stem to allow rotation between the second and third components about the axis of the stem independent of the relative position between the first and second components and for supporting rotary compressive forces between the second and third components.

4,219,894

TILE CONSTRUCTION FOR A SWIMMING POOL

Henry Jakowicki, 123 Malts Ave., West Islip, N.Y. 11795

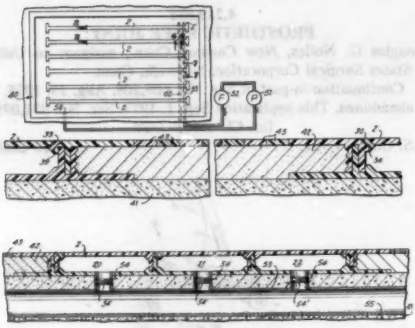
Continuation-in-part of Ser. No. 734,328, Oct. 20, 1976, Pat. No. 4,051,562. This application Oct. 3, 1977, Ser. No. 839,039

Int. Cl.² E04H *3/16, 3/18*

U.S. Cl. 4—488 **27 Claims**

1. A swimming pool construction comprising a pool, a deck surrounding said pool and including a tile construction comprising a plurality of elongated members arranged adjacent one another, each member having a longitudinal channel therein, said member being provided with a plurality of orifices extending into said channel and opening externally of the member to provide communication between the channel and the exterior of the member to provide a flow path for a fluid, said member having an outer surface constituting part of the surface constituting part of the surface of the deck, said orifices being open in the vicinity of said outer surface, said elongated member

being an extrudate, each member receiving overflow water from the pool via said orifices, a reserve tank beneath said deck



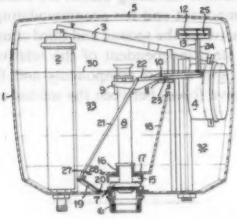
communicating with the water in the pool, the channels of said members being in communication with said reserve tank.

4,219,895

VARIABLE VOLUME FLUSHING CISTERN

Bruce R. Thompson, Tranmere, Australia, assignor to United Packages limited, Australia

Filed Nov. 30, 1978, Ser. No. 964,825
Claims priority, application Australia, Dec. 6, 1977, PD2675
Int. Cl.[2] E03D 1/14
U.S. Cl. 4—325 **7 Claims**



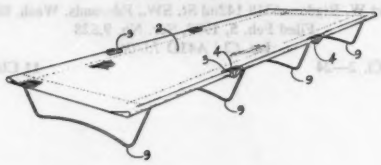
1. A variable volume flushing cistern comprising; a body having a division wall across it to form a first compartment and a second compartment, a float in the said first compartment, a water inlet in the said second compartment connected to be actuated by the said float, a flushing valve in the said first compartment positioned to discharge water from the said first compartment and movable by an operating stem passing through the said division wall, a movable flap forming part of the said division wall to allow the said second compartment to be isolated from the said flushing valve in the said first compartment, and means connected to the said flushing valve and the said flap to actuate the said flushing valve only or the said flushing valve and the said flap together, whereby to initiate a large flush from both said compartments or a smaller flush from said first compartment, said division wall having a portion extending over the flushing valve and on one side extending upwardly and on the other side having a portion adapted to be engaged by the said flap, the said flap being hinged to the floor of the said body to define with the division wall the said first and the said second compartments.

4,219,896

COT STRUCTURE

O'Neal Behel, 103 Chickamauga St., Sheffield, Ala. 35660

Filed May 7, 1979, Ser. No. 36,668
Int. Cl.[3] A47F 1/00
U.S. Cl. 5—114 **2 Claims**



1. In a cot structure of the character described having parallel side rails and a weight bearing flexible body supporting sheet suspended therebetween, with removable leg support members in spaced relation lengthwise along said side rails, the combination comprising:

hinge members joining sequential lengths of said side rails;

said hinge members having a downwardly disposed pivotal joint connecting extended congruent angled laterally disposed face plates in weight bearing mode, such plates disposed in occlusive contact in said mode to provide maximal extensive and lateral dispersal of the force vectors per unit of bearing surface with multiplanar resolution of the force moments about their pivotal junctures;

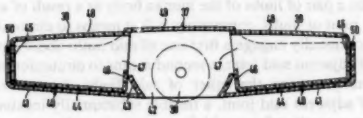
said face plates further comprising an inverted L-shaped box configurated overplate and a semi-L-shaped box configurated underplate pivotally connected thereto, said underplate having a greater under support mass, and said overplate and underplate having their congruent occlusive faces during weight bearing mode on said side rails resolving the opposing force moments relative to their transverse pivotal juncture into at least two divergent force planes.

4,219,897

CARPET SWEEPING DEVICE

Johannes Leibscher, Nassau, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit International Günter Leifheit GmbH, Nassau, Fed. Rep. of Germany

Division of Ser. No. 926,848, Jul. 21, 1978, which is a continuation of Ser. No. 758,548, Dec. 20, 1976. This application Oct. 10, 1978, Ser. No. 950,540
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1976, 2600102; Feb. 13, 1976, 2605835
Int. Cl.[2] A47L 11/33
U.S. Cl. 15—41 R **3 Claims**



1. A device for sweeping surfaces, particularly carpets or the like, comprising a housing reciprocatable in a predetermined direction and having a pair of side walls extending transversely spaced from each other in said direction and wall means extending transverse to said side walls forming a pair of compartments having upper open ends; a brush mounted in the region between said compartments for rotation about an axis normal to said side walls in contact with the surface to be swept and rotatable in one or the opposite direction depending on the direction of movement of said housing so that dirt picked up by said brush from said surface travels in one or in opposite paths; a pair of dirt collecting receptacles respectively insertable into

said compartments through said upper open ends of the latter, said dirt collecting receptacles being closed on all sides with the exception of an inlet opening extending transverse to the respective paths so that dirt picked up by said brush is thrown through the inlet opening in the respective receptacle into the latter; and locking means comprising cooperating portions on said housing and said receptacles for releasably locking said receptacles, when inserted into said compartments, in positions in which said inlet openings extend transverse to said paths.

4,219,898

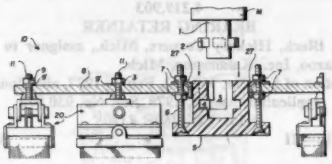
FLOATING BRUSH FLOOR CLEANER

Harry A. Presby, 106 S. Curry St., Carson City, Nev. 89701

Filed Feb. 14, 1979, Ser. No. 11,805

Int. Cl.[2] A47L *11/164*

U.S. Cl. 15—49 R **6 Claims**



1. A floating brush floor cleaner comprising a support plate, a motor, a handle connected to a housing surrounding said motor, a drive support mechanism to connect a shaft depending from said motor to said support plate, and a plurality of discrete floating brushes each depending from said support plate by means of an inverted U-shaped element each having an upwardly extending bolt which traverses through the support plate and is fastened thereto and said inverted U-shaped element has fastened on its downwardly extending legs a pair of angle irons on outer faces of said legs, a second bolt extending through said angle irons and said inverted U-shaped element pivotally supporting said angle irons relative to said U-shaped element, and a biasing spring disposed around said bolt second bolt and within a crotch portion of said U-shaped element, and one of said brushes depends from each pair of said angle irons whereby rocking can occur between said brush and said U-shaped element about said second bolt so that each of said brushes can conform to undulations in a floor surface.

4,219,899

PAINT PAD ASSEMBLY

Adam Zurawin, 303 E. 57th St., New York, N.Y. 10022, and Gaetano Ricciuti, 3003 Wallace Ave., Bronx, N.Y. 10467

Division of Ser. No. 843,212, Oct. 18, 1977, Pat. No. 4,164,803. This application Jan. 24, 1979, Ser. No. 6,236

Int. Cl.[2] B25G *3/38*; B44D *3/00*

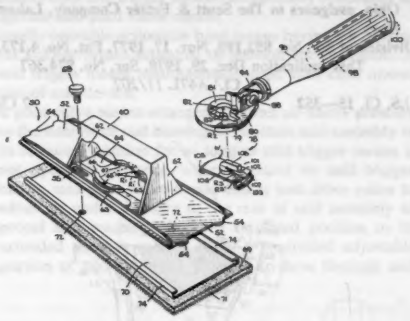
U.S. Cl. 15—144 A **1 Claim**

1. In a paint pad support and handle assembly of the type used to support a removable paint pad and to guide said pad across a surface to be painted, the improvement comprising:

a substantially planar paint pad support body;

a handle;

means for mounting said handle on said support body for swinging movement of about 90° about a first axis substantially parallel to the plane of said support body at a turning point located above and to one side of the main axis of said paint pad support body for maintaining said pad in surface-to-surface relation with the surface being painted independent of the position of the user relative to said paint pad and for pivotal movement about a second axis substantially perpendicular to the plane of said support body; and



a circular spring clip located substantially at and around said turning point for biasing said handle in a given direction of swinging movement therearound.

4,219,900

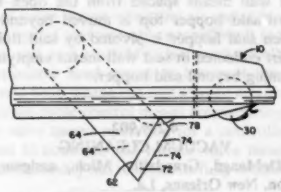
PIVOTING NOZZLE DUCT

Robert F. Dyer, Rancho Palos Verdes, Calif., assignor to The Hoover Company, North Canton, Ohio

Continuation of Ser. No. 914,036, Jun. 9, 1978, abandoned. This application Jul. 30, 1979, Ser. No. 61,687

Int. Cl.[3] A47L *9/00*

U.S. Cl. 15—339 **7 Claims**



1. In a nozzle body, the combination including;

(a) a housing for said nozzle body extending from front to rear thereof,

(b) a rigid suction duct extending within said housing from front to rear thereof a substantial distance and communicating a suction source and a working area of said nozzle,

(c) said rigid duct pivotally mounted relative to said nozzle body at a pivot on said nozzle body and said rigid duct occasionally being clogged with dirt and dust taken in at said nozzle working area,

(d) said rigid duct being freely pivotable outwardly of the confines of said nozzle body on said pivot for declogging and clean out purposes,

(e) said duct being of elongated configuration,

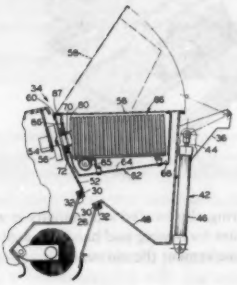
(f) a slanted portion on the end of said duct, slanting with respect to said elongation, and

(g) a conforming means for providing said communication, said slanted portion cooperating with said conforming means to provide a full seal.

4,219,901
RIDING SWEEPER

Jack L. Burgoon, and Christopher M. Knowlton, both of Toledo, Ohio, assignors to The Scott & Fetzer Company, Lakewood, Ohio

Division of Ser. No. 852,199, Nov. 17, 1977, Pat. No. 4,173,052. This application Dec. 29, 1978, Ser. No. 974,367
Int. Cl.³ A47L 11/202
U.S. Cl. 15—352 7 Claims

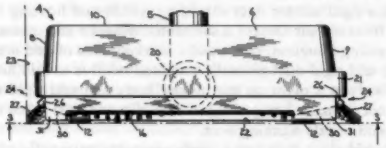


3. A sweeping machine comprising a body, a drum brush rotatably carried by said body in a transverse position, a hopper having an open top, said hopper being located at a front portion of said body, said hopper having a forward upper portion pivotally connected to said body, at least one fluid-operated ram having one end pivotally connected to said hopper and another end connected to said body, said fluid-operated ram being positioned to pivot said hopper forwardly over the front of said body when said ram is extended, wall means forming a filter chamber located in said hopper, said wall means forming an outlet opening for communication with an exhaust blower and an inlet opening at a forward portion thereof near the bottom of said filter chamber for communication with the interior of said hopper, said wall means being pivotally carried by said hopper in a position such that said wall means swings to an open position with the forward portion of said wall means spaced from the open top of said hopper when said hopper top is moved beyond a vertical position when said hopper is pivoted by said fluid-operated ram, with dirt collected in said wall means emptying through the inlet opening beyond said hopper.

4,219,902
VACUUM CLEANING

Donald R. DeMaagd, Grandville, Mich., assignor to Oreck Corporation, New Orleans, La.

Filed Feb. 9, 1979, Ser. No. 10,599
Int. Cl.³ A47L 9/04, 9/06
U.S. Cl. 15—364 4 Claims



1. For use in a vacuum type floor cleaner having means to provide a suction flow of air, a lower head unit comprising:

(a) a housing having front and rear walls joined by side walls,

(b) means on said housing forming a vacuum inlet chamber,

(c) a transversely extending rotary brush disposed in said chamber,

(d) means to drive said rotary brush so that dirt and similar material on the floor are loosened thereby and sucked into said chamber by the flowing air,

(e) downwardly inclined stationary brush means fixedly attached on each side of said housing and extending transversely outwardly therefrom for engagement with the floor for loosening said material as said floor cleaner is translated over the floor so that said latter loosened material is sucked into said chamber,

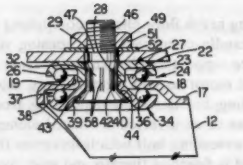
(f) and a transverse slot disposed in said housing adjacent each said brush means and communicating between the outside of said housing and said chamber so that material loosened by said brush means is drawn by the air flow through the slot and into said chamber,

(g) each said transverse slot being disposed forwardly of its respective brush means and communicates with the forward part of said chamber adjacent said rotary brush so that material drawn through said slot is brought into engagement with said rotary brush.

4,219,903
BEARING RETAINER

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Continuation of Ser. No. 767,152, Feb. 9, 1977, abandoned. This application Aug. 3, 1978, Ser. No. 930,873
Int. Cl.² B60B 33/08
U.S. Cl. 16—21 5 Claims



1. In a king pin and bearing construction for a swivel caster having a swivel plate with a central opening therethrough, comprising: first and second annular bearing ball retainers disposed upon opposite sides of and spaced from the swivel plate, said retainers having a cylindrical central opening therethrough and an annular and coaxial flange means adjacent their inner edges, said flange means extending toward each other and firmly limiting movement of said retainers toward each other, one of said flange means having a substantially cylindrical portion and both of said flange means having first means defining recesses therein with walls diverging away from the swivel plate disposed intermediate therebetween; a plurality of bearing balls disposed between said retainers on opposite sides of said swivel plate for snug rolling engagement with said retainers and said swivel plate; a king pin having a central cylindrical portion snugly disposed within said central opening in said flange means and said cylindrical portion, said king pin having second means defining a pair of integral and axially spaced, annular flange portions near the opposite ends of said central portion, said annular flange portions having tapered outer surfaces converging toward each other and of substantially the same shape as and snugly received into the recesses in said flange means, at least one of said annular flange portions being formed by deforming the material of said king pin during assembly of said bearing construction to said king pin, whereby relative axial movement of said first and second retainers is positively opposed by said pair of annular flange portions, the improvement comprising positive securement means for positively securing said first and second bearing ball retainers to said king pin to prevent a relative rotation between said bearing ball retainers and said king pin, said positive securement means including at least first serrations integrally provided on said walls of one of said recesses in one of said first and second bearing ball retainers, one of said annular flange portions on

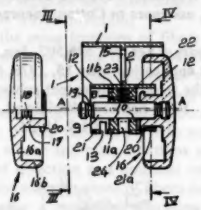
said king pin including second serrations integral therewith and in meshing engagement with said first serrations to positively interlockingly secure said one of said first and second bearing ball retainers to said king pin, said second serrations being formed in response to a deforming of the material of said king pin to form said one annular flange portion to thereby effect said positive securing of said first and second bearing ball retainers to said king pin.

4,219,904

SELF-ORIENTABLE WHEEL MECHANISM FOR FURNITURE

Francescantonio Melara, Bologna, Italy, assignor to Emilsider Meccanica S.n.c. di Melara Francescantonio & Co., Cadriano di Granarolo Emilia, Italy

Filed Dec. 27, 1977, Ser. No. 864,999
Claims priority, application Italy, Dec. 29, 1976, 3632 A/76
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—47 **2 Claims**



1. A two wheel castor for furniture, comprising a vertical wall, a seat extending through said wall perpendicularly thereto and defining front tubular projections on either side of said wall, a shaft supported in said seat and having its opposed ends projecting outside of said seat on either side thereof, a pair of wheels pivotally secured to said opposed ends and having tubular hubs provided with outer collars close to said projections, a sleeve formed in said wall in the plane thereof and perpendicular and offset with respect to said seat, a pivot pin journaled in said sleeve and adapted to be inserted in a vertical socket of an article of furniture to which the castor is to be fitted, front bushings defined on either side of said wall and disposed around said projections such as to accomodate said hub slots cut at the lower area of said bushings and extending along an arc of a circle and defining ring portions between said slots and free ends of said bushings, said ring portions being deformed for engagement behind said collars such as to retain said wheels axially, a vertical hole formed in said wall and communicating with said seat, elastic means arranged in said hole and acting on said shaft, said seat being elongated in a substantially vertical plane thus permitting friction contact of said hubs with said deformed ring portions when the castor is in unloaded condition and free rotation of the hubs when the castor is in loaded condition.

4,219,905

ANIMAL STUNNING GUN

Fred E. Thacker, 91113 Sunderman Rd., and Verdell Noteboom, 91161 Sunderman Rd., both of Springfield, Oreg. 97477

Filed Apr. 27, 1978, Ser. No. 900,423
Int. Cl.[2] A22C *11/00*
U.S. Cl. 17—1 B **3 Claims**

1. A stunning device for use on meat animals comprising:

a hollow pistol shaped housing having means for connecting a source of air under pressure thereto;

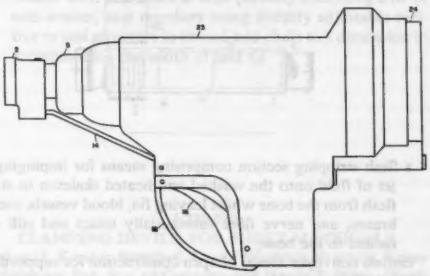
an elongated piston-needle assembly having a restricted opening formed axially therethrough positioned within said housing for reciprocal motion in guiding means formed in the interior of said housing, said assembly having a retracted and an extended position;

pneumatic drive, retract and pilot valve means carried by said housing;

manually operable trigger means mechanically connected to operate said pilot valve means;

manually operable actionator head means having a mechanical linkage means arranged to prevent the operation of said trigger means until manually reset after each operation of said device;

said pilot valve means arranged to admit air under pressure to the interior of said housing to maintain said assembly in its retracted position for so long as said trigger means is not operated whereby, when operated by said trigger means, said pilot valve means causes said drive valve to admit air under pressure to the rear of said assembly to propel said assembly from its retracted position to its extended position and to allow a controlled adjustable portion of said air under pressure to flow through said



axial opening to clear a path for the tip end of said assembly and, when said needle has penetrated the skull of an animal, to deposit a controlled, adjustable amount of air into the skull cavity of said animal sufficient to stun said animal without interfering with proper bleeding of said animal and without said assembly carrying hair or other foreign matter into the skull of the animal;

said assembly being arranged to operate, in its extended position,

said retract valve means admitting air under pressure to the forward end of said assembly propelling it to its retracted position and said assembly also mechanically operating said actionator head means to interrupt the linkage between said head means and said trigger means; and adjustable retract cycle control means arranged to prevent said retract valve means operation for a controlled period of time and to continue said retract valve means operation until said assembly has reached its fully retracted position.

4,219,906

TREATMENT OF FISH

John S. Crossland; David Grimstead, both of Grimsby, and Simon P. Guy, Portishead, all of England, assignors to St. Clair Fisheries Ltd., Aberdeen, Scotland

Filed May 30, 1978, Ser. No. 910,341
Claims priority, application United Kingdom, Jun. 2, 1977, 23347/77
Int. Cl.[3] A22C *17/04, 17/00*
U.S. Cl. 17—46 **11 Claims**

1. A method for the recovery from filleted fish skeletons of flesh at least substantially free of fin, blood vessels, membrane, and nerve fibre comprising the steps of:

(a) washing a fish skeleton from a filleting operation;

(b) heating the washed skeleton such that the temperature of flesh on the skeleton is raised to lie in the range of 40° C. to about 75° C. to weaken the bond between said flesh and the skeleton bone; and

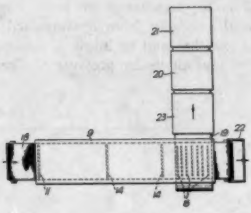
(c) impinging a jet of fluid onto the washed and heated skeleton to strip flesh from the bone whilst leaving fin,

blood vessels, membrane, and nerve fibre substantially intact and still attached to the bone.

7. Apparatus for the recovery from filleted fish skeletons of flesh at least substantially free of fin, blood vessels, membrane and nerve fibre comprising:

a washing section comprising means for washing filleted fish skeletons;

a heating section comprising means for heating the washed fish skeletons such that the temperature of the flesh on the skeleton is raised to lie in the range of 40° C. to about 75° C. to weaken the bond between said flesh and the skeleton bone;



a flesh stripping section comprising means for impinging a jet of fluid onto the washed and heated skeleton to strip flesh from the bone whilst leaving fin, blood vessels, membranes, and nerve fibre substantially intact and still attached to the bone;

endless conveyor means of open construction for supporting fish skeletons placed thereon and for conveying them in parallel lanes sequentially through said washing section, heating section and stripping section, said conveyor means including an upper, conveying, pass and a lower, return, pass; and

collector means positioned below the upper pass of the conveyor for receiving, through said upper pass, the flesh stripped from the skeleton.

4,219,907

TREATMENT OF FISH

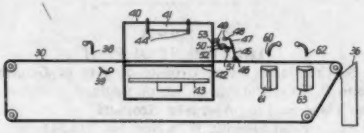
Derek E. Fuller, Kingston, England, assignor to St. Clair Fisheries, Aberdeen, Scotland

Division of Ser. No. 910,341, May 30, 1978. This application Jul. 14, 1978, Ser. No. 924,816

Claims priority, application United Kingdom, Jun. 2, 1977, 23347/77

Int. Cl.³ A22C *17/04, 17/00*

U.S. Cl. 17—46 **9 Claims**



1. A method for the recovery from filleted fish skeletons of flesh at least substantially free of fin, blood vessels, membrane, and nerve fibre comprising the steps of:

(a) washing a fish skeleton from a filleting operation;

(b) heating the washed skeleton to weaken the bond between said flesh and the skeleton bone;

(c) pommelling the heated flesh to further weaken the bond between bone and flesh; and

(d) impinging a jet of fluid onto the washed and heated skeleton to strip flesh from the bone whilst leaving fin, blood vessels, membrane, and nerve fibre substantially intact and still attached to the bone.

4. Apparatus for the recovery from filleted fish skeletons of flesh at least substantially free of fin, blood vessels, membrane and nerve fibre comprising:

a washing section comprising means for washing filleted fish skeletons;

a heating section comprising means for heating the washed fish skeletons to weaken the bond between said flesh and the skeleton bone;

a pommelling section comprising means for pommelling the heated skeleton to further weaken the bond between bone and flesh; and

a flesh stripping section comprising means for impinging a jet of fluid onto the washed and heated skeleton to strip flesh from the bone whilst leaving fin, blood vessels, membranes, and nerve fibre substantially intact and still attached to the bone.

4,219,908

PROCESS AND APPARATUS FOR TREATING FIBROUS MATERIALS FOR SUBSEQUENT PROCESSING

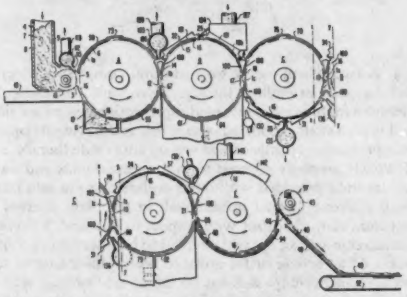
Allen R. Winch, Westfield, N.J., and Charles H. Chewning, Jr., Durham, N.C., assignors to Cotton, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 698,502, Jun. 22, 1976, Pat. No. 4,126,914. This application May 15, 1978, Ser. No. 905,964

The portion of the term of this patent subsequent to Dec. 28, 1995, has been disclaimed.

Int. Cl.² D01G *15/26*

U.S. Cl. 19—99 **23 Claims**



1. A process for treating a gross mass of tangled, randomly oriented fibers, which process comprises:

(I) conveying the gross mass of fibers in a generally longitudinal travel direction to a first location at a rate of above about 400 pounds per hour while gripping the gross mass of fibers;

(II) subjecting the gripped mass of fibers to a deflection at a first location to cause leading fiber portions of mass fractions of fibers to experience a deflecting motion generally transverse to the longitudinal travel direction and simultaneously subjecting the leading fiber portions of the mass fractions to an accelerating force in the first circular direction of travel for the fibers, the force tending to accelerate the mass fractions of fibers in the first circular travel direction and to thereby increase the linear speed of the mass fractions of fibers to a linear speed of above about 2,000 feet per minute, the deflecting in the transverse direction and accelerating force in the first circular travel direction while gripping the gross mass of fibers effecting plucking of the mass fractions from the gross mass of tangled, randomly oriented, fibers and assisting in thinning and orienting the mass of fibers in the travel direction and assisting in disentangling the fibers;

(III) at a second location downstream of the first location subjecting the mass fractions of fibers traveling in a circular travel direction to a generally tangential accelerating force to thereby further increase the linear speed of the

mass fractions of fibers in a second circular travel direction sinuous to the upstream circular travel direction to cause the fibers to accelerate freely in the second location, the combined effects of accelerating sinuously and carding on the first face portion tending to thin and draft apart individual fibers in the travel direction and tending to separate and disentangle individual fibers laterally of the travel direction;

(IV) at a third location downstream of the second location subjecting the mass fractions of fibers traveling in a circular travel direction to another generally tangential accelerating force to thereby still further increase the linear speed of the mass fractions of fibers in a third circular travel direction sinuous to the upstream circular travel direction to cause the fibers to accelerate freely in the third circular travel direction while at the third location carding a second face portion on a mass fractions side opposite the first face portion of the mass fractions of fibers, the combined effects of accelerating sinuously and carding on the second opposite face portion tending to thin and draft apart individual fibers in the travel direction and tending to separate and disentangle individual fibers laterally of the travel direction;

(V) subjecting the mass fractions of fibers at a subsequent location downstream of the third location to a decelerating force to thereby decrease the linear speed of the mass fractions of fibers to cause consolidating of the individual fibers and condensing of the mass fractions of fibers;

(VI) subsequent to step (II) and prior to step (V) at at least one location where the mass fractions of fibers are in a circular travel direction at a constant velocity, additionally carding the mass fractions of fibers on at least one face portion to cause a retarding effect on individual fiber portions in the carded face portion while the velocity of remaining individual fiber portions is being maintained, thereby aiding in orienting and separating individual fibers in the travel direction and separating individual fibers in the travel direction and laterally thereof and aiding in further disentangelement of individual fibers; and;

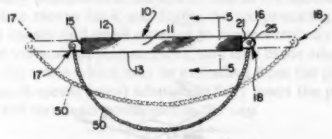
(VII) subsequent to step (V), recovering at a rate of above about 400 pounds per hour a consolidated mass of fibers.

4,219,909

COMBINED CLASP AND TIE SLIDE

Olof V. Anderson, North Kingstown, R.I., assignor to Anson Incorporated, Providence, R.I.

Filed Jan. 22, 1979, Ser. No. 5,437
Int. Cl.² A41D *25/04*
U.S. Cl. 24—49 R **6 Claims**



1. A combined clasp and adjustable tie slide comprising:

a. a hollow elongated structure having open opposite ends, a face plate, top and bottom walls and a back side;

b. Said top and bottom walls having generally parallel plane interior surfaces,

c. a pair of elongated members slidingly engaging said structure, from said opposite ends,

d. said members each having opposing plane edges which are generally parallel along a greater portion of the length of said members with said opposing plane edges inclining inwardly as tapered portions at respective first ends of said members,

e. the width of each said member between its generally parallel plane edges being substantially equal to the distance between the interior surfaces of said top and bottom walls to thereby afford frictional engagement between said walls and the edges of said members proximate thereto,

f. a tapered elongated slot extending axially inward from said first end of each said member,

g. a separate rivet fastened to said face plate and said back side of said structure and extending across a related one of said slots,

h. each said rivet serving to expand a related one of said tapered portions to a position whereby the plane edges of each said tapered portion frictionally engage the plane interior surfaces of said top and bottom walls of said structure as each of said members is slid relative to said structure,

i. an elongated chain interconnected between respective second ends of said pair of members, and

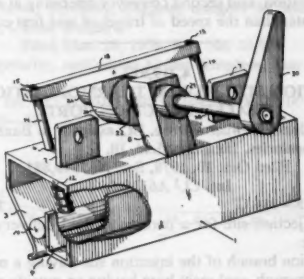
j. clasp means for attaching said structure to a garment of a wearer with said chain at least partially encircling a tie of said wearer, said members being slidably adjustable relative to said structure to extend said chain to a dimension to accommodate the width of said tie.

4,219,910

CLAMPING DEVICE FOR SHEET MATERIALS

Lothar H. Kruska, Stamford, Conn.; Friedrich Hanstein, Gross-Zimmern, Fed. Rep. of Germany, and Haven T. Owen, Cheshire, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,569
Int. Cl.² H44B *21/00*
U.S. Cl. 24—263 SB **3 Claims**



1. A clamping device for use during thermoforming operations which is resistant to temperatures in the range of 150° to 200° C. comprising in combination:

(a) stationary frame;

(b) a clamping rod located within said stationary frame, said clamping rod being of sufficient length so as to uniformly hold clamped objects;

(c) a compression means located within said frame such as to compress said clamping rod against said stationary frame, said compression means being a plurality of springs sufficiently biased to maintain clamped objects in a vertical position;

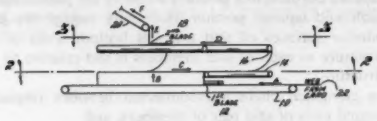
(d) a plurality of slidably movable pistons attached at one end to said clamping rod and projecting out through a plurality of openings in said stationary frame;

(e) a releasing means engaging said plurality of slidably movable pistons such as to counteract said compression means.

4,219,911
APPARATUS FOR EXPANDING THE WIDTH OF PREFORMED FIBROUS WEBS

John C. Henning, Cincinnati, Ohio, assignor to The Stearns & Foster Company, Cincinnati, Ohio

Division of Ser. No. 665,618, Mar. 10, 1976, Pat. No. 4,106,166.
This application May 22, 1978, Ser. No. 908,399
Int. Cl.[2] D04H 1/70
U.S. Cl. 28—103 10 Claims



1. Apparatus for expanding the width of a continuous length of a preformed fibrous web of staple fibers comprising at least one blade having an edge for locking web fibers and controlling the uniformity of fiber orientation throughout the width of web expansion, means for moving said web in a lengthwise direction at an angle to at least a portion of said edge, and means for abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction and turning the web fibers in said second direction while web fibers are locked at said edge to expand said width with controlled uniformity of fiber orientation.

10. Apparatus for expanding the width of a continuous length of a preformed fibrous web of staple fibers comprising at least one blade having an edge for locking web fibers and controlling the uniformity of fiber orientation throughout the width of web expansion, a first conveyor for carrying said web in a lengthwise direction at an angle to at least a portion of said edge and a second conveyor for carrying the web and abruptly changing the direction of travel of said web at said edge from said lengthwise direction to a second direction and turning the web fibers in said second direction while web fibers are locked at said edge to expand said width with controlled uniformity of fiber orientation, said second conveyor operating at a speed of travel greater than the speed of travel of said first conveyor.

4,219,912
INJECTION SITE HAVING THERMOPLASTICALLY SEALED INJECTION PORT

Elvis E. Adams, Downers Grove, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 10, 1978, Ser. No. 949,881
Int. Cl.[3] A61M 5/00
U.S. Cl. 128—214 G 17 Claims

1. An injection site for a parenteral fluid delivery system, comprising:

an injection branch of the injection site having a main bore therethrough, said main bore having an outside end and a fluid outlet;

an elastomeric injection port plug having an outside surface including an outside surface of a wall penetrable by a hypodermic needle, said port plug having an annular outwardly projecting boss, said annular outwardly projecting boss being spaced from said outside surface to form an annular step between said outside surface and said boss of the port plug;

a fluid passageway branch of the injection site, said fluid passageway branch having a passageway that opens into said main bore of the injection branch at a location between said injection port plug and said fluid outlet of the main bore of the injection branch;

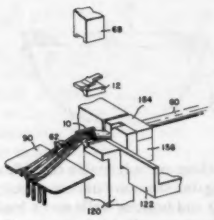
a thermoplastic seat at said outside end of said main bore of the injection branch, said seat being generally complementary to the outside surface of said injection port plug and said injection port plug being within said seat; and

said seat having a seal overlying said annular step of the port plug for encapsulation of said injection port plug except for at least part of said outside surface of the plug, said seat seal being formed by a horn for imparting vibratory energy to said outside end of the main bore of the injection branch, said seat seal including substantially the entirety of said outside end of the main bore.

4,219,913
ASSEMBLY MACHINE

Keith Johnson, Jr., Sporting Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 21, 1978, Ser. No. 934,740
Int. Cl.[2] H01R 43/00
U.S. Cl. 29—33 M 3 Claims



1. A machine for assembling a cap with partially inserted terminals and a base to form a modular telephone plug and to terminate a plurality of wires therein, said machine comprising:

a. a base structure having support means thereon to support first and second parallel plates for reciprocal movement horizontally therethrough, and further having two vertical support means, one to support an elevating member and another to support an anvil member for reciprocal movement vertically, said structure further having track means on which 2 cap-carrying carrier strip may be

moved and further having a wire support station across which wires may be laid;

b. a feed unit comprising a rectangular first parallel plate slidably positioned in said structure with power means to slide said plate back and forth, said first parallel plate having at least one cap-engaging pawl on its upper edge and a slot with an angled section therein located adjacent one end, said feed unit further including an elevating member slidably positioned in one of said vertical support means and having a roller laterally connected thereto, said roller being movably positioned in the slot so that as the first parallel plate moves back and forth the reciprocating movement causes the elevating member to move vertically in the one vertical support member, so that as said first parallel plate and at least one pawl advances a cap, said elevating member elevates it up to in front of said wire support station, said elevating member providing a work station on which the cap is positioned;

c. a wire clamp unit attached to the base structure and comprising first a stationary support plate having thereon a generally vertical trending groove, an elongated member slidably positioned in the groove with wire clamping means on the top end and with a roller adjacent the lower end, and secondly a wedge member fixed to power means which removably drives the wedge member into blocking engagement with said roller to hold said wire clamping means against wires which may be positioned across the wire support station;

d. bonding means for bonding a base to the cap which may be positioned on the elevating member with wires projecting forwardly from the wire support station being positioned therein between thereby forming a modular telephone plug;

e. a plug clamp unit having an arm with a plug clamping pad at its free end and pivotally connected at its other end, a shaft connected to power means for reciprocating the shaft, link means connecting the shaft to the arm whereby the reciprocating of the shaft rotates the arm, said unit adapted to removably hold a plug which had been formed by said bonding means;

f. a trim-insertion unit comprising a rectangular second parallel plate slidably positioned in said structure with power means to slide said plate back & forth, said second parallel plate having a trim blade on its upper edge and an elongated slot with an angled section therein located adjacent one end, said trim-insertion unit further including an elongated anvil member having anvil means on its upper surface and being slidably positioned in (another of said) the other vertical support means, said anvil member having a roller connected thereto with the roller being movably positioned in the slot so that as the second parallel plate moves back and forth, the reciprocating movement causes said anvil member to move vertically in said other vertical support member, said trim blade adapted to trim the wires which may be extending from the plug and the anvil means (may) adapted to fully insert the partially inserted terminals positioned in the cap.

4,219,914
ARRANGEMENT FOR OPENING AND CUTTING UP PACKAGING STRAPS FOR SCRAP

Günter Bartzick, Gevelsberg, and Gerd Bühne, Schwelm, both of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dormund, Fed. Rep. of Germany

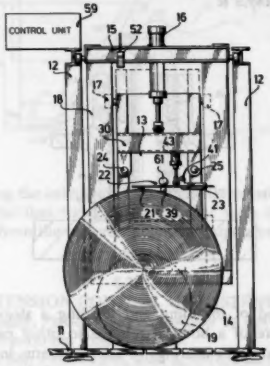
Filed Dec. 13, 1978, Ser. No. 969,064

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803572

Int. Cl.³ B23D *15/04*

U.S. Cl. 29—56.5 **9 Claims**

1. An arrangement for opening and cutting up packaging straps for scrap, comprising: a transport track; a framework spanning said transport track; a traveling frame traveling transversely to said transport track; a cross beam with adjustable elevation; means for snipping and cutting up strapping fastened to said cross beam; sensing means for determining positions of a package and of packaging strips on the package; shears and shear blades with positions determined by said sensing means; control means connected to said sensing means and having a preset control program; and drive means for said transport



track, said traveling frame, said cross beam and said means for snipping and cutting up; said control program switching said drive means on and off; said shears simultaneously cutting said strapping and chopping up said strapping; an end of said strapping being clamped simultaneously with the cutting of the strapping.

4,219,915
ABRADING TOOL BLADES AND METHOD OF MAKING SAME

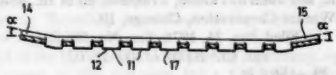
David B. Scott, Sheffield, England, assignor to Stanley Tools Limited, United Kingdom

Filed Mar. 28, 1979, Ser. No. 24,684

Claims priority, application United Kingdom, Mar. 31, 1978, 12639/78

Int. Cl.³ B23D *71/00, 73/04;* **B21K** *21/00*

U.S. Cl. 29—78 **6 Claims**



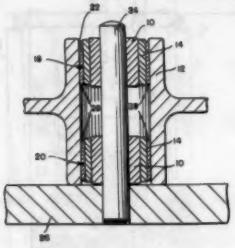
1. An elongate substantially rectangular abrading tool blade formed of sheet metal and having a multiplicity of cutting teeth distributed over a cutting face of the blade and a multiplicity of associated through-the-blade apertures, the cutting teeth and associated apertures extending in several parallel rows across the blade at an angle other than perpendicular to the longitudinal axis of the blade, with several cutting teeth and associated apertures in each row, all the said cutting teeth facing in a common single direction which is perpendicular to the said rows, each said aperture being directly in front of and adjacent its associated cutting tooth relative to said common single direction, two longitudinal side edge portions of the blade being bent back through an acute angle relative to the cutting face from a longitudinal, substantially flat, middle portion of the blade, the rows of cutting teeth and apertures extending across the full width of the middle portion of the blade and at least to the boundaries of said middle portion with the side edge portions, terminating short of both outside edges of the blade.

4,219,916

BEARING CARTRIDGE MOUNTING METHOD

Roger S. Kincel, Whittier, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 1, 1977, Ser. No. 820,569
Int. Cl.[3] B21D *53/10*
U.S. Cl. 29—149.5 R 2 Claims



1. A method of installing and locating a sleeve bearing within the bore of a housing relative to other parts of the apparatus or to other bearings in said apparatus in a manner that will assure the accurate orientation of the axis of the bearing bore, said method comprising:

pressing the bearing into an outer sleeve, which sleeve has an outer diameter smaller than the inside diameter of the housing bore;

sizing the inner diameter of the bearing bore;

positioning the bearing bore upon a precision guide mandrel and orienting the assembly of the bearing, the outer sleeve and the mandrel within the housing bore;

filling the gap between the outer surface of said sleeve and the inside diameter of said housing bore with an adhesive;

curing said adhesive while maintaining the previously determined orientation of the axis of the bearing bore relative to said other parts of the apparatus or to said other bearings; and

removing said guide mandrel from said bearing bore.

4,219,917

PUMP MODIFICATION FOR MATCHING PERFORMANCE

John L. Bearden, Schaumberg; Sankaraiyer Gopalakrishnan, Roselle, and John J. Tuzson, Evanston, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 21, 1976, Ser. No. 698,231
Int. Cl.[3] B23P *13/00, 15/02*
U.S. Cl. 29—156.4 R 1 Claim

1. A method for changing the operating flow characteristics of a multi-stage centrifugal pump to a lower operating flow characteristic having substantially the same operating efficiency, each diffuser having guide vanes with a leading edge and a trailing edge, said tracking edge being adjacent to the next impeller in the direction of fluid flow, said guide vanes directing the flow of fluid to the next adjacent impeller, the steps comprising:

constructing the guide vanes of each diffuser to a given length to provide a first operating characteristic with a first flow characteristic and, thereafter,

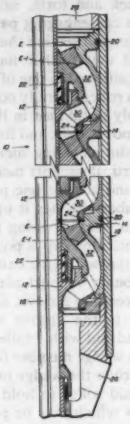
reducing the length of the trailing edge only of at least one of the guide vanes to change the operating characteristics to a lower flow characteristic,

the location of the reduction being identified by θ in the equation;

$$=Q \tan \theta/2\pi rb$$

where

=required tangential velocity at the impeller eye
Q=desired flow rate
θ=diffuser blade angle with the radial direction of the blade



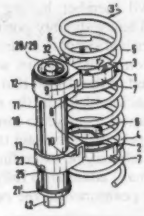
b=axial width of diffuser
π=average radius of impeller eye.

4,219,918

COMPRESSION SPRING CRAMP

Horst Klann, Terra Wohnpark 11, 7730 VS-Villingen 24, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 18,901
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813381
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—227 11 Claims

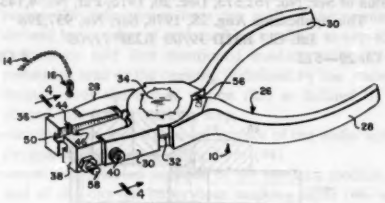


1. A compression spring cramp for large helical or coil springs, particularly axle springs of motor vehicles, comprising, a hollow guide tube, a threaded spindle rotatably mounted in said hollow guide tube, a first gripper having an inner portion secured to said guide tube adjacent the top thereof and having a substantially semi-cylindrical spring-engaging channel portion extending outwardly from said inner portion and opening downwardly so as to be engageable over a coil of the spring, a second gripper having an inner slider portion threadedly engaged on said spindle for upward and downward movement within said guide tube upon rotation of said spindle and having a substantially semi-cylindrical spring-engaging channel portion extending outwardly from said slider portion and exteriorally of said hollow guide tube and opening upwardly to engage below a coil of the spring.

4,219,919
JEWELRY CONNECTOR

Miklos Fischbein, and Herman Benedek, both of Brooklyn, N.Y., assignors to Elegant Merchandising, Inc., New York, N.Y.

Filed Sep. 26, 1978, Ser. No. 945,905
Int. Cl.³ B25B 27/00
U.S. Cl. 29—270 14 Claims



10. A device for connecting a clasp member having a terminal end portion with a height equal to a first predetermined distance to the end of a decorative chain, to provide an article of jewelry in which said chain is provided with indentations along the side edges spaced apart a second predetermined distance, and said clasp member being provided with a chain receiving passage portion defined in part by opposed sidewalls and a terminal end portion; said device comprising:

a plier having a pair of handle and jaw sections rotatably connected together whereby said jaw sections are movable toward and away from each other;

aligned open-ended slots in said jaw sections defining a recess adapted to receive the clasp member therein with the bottom wall of said slots in facing relationship to sidewalls of said clasp member; and

a plurality of projections on said bottom wall being spaced apart said second predetermined distance to be operable to deform the walls of said clasp member into the indentations of the chain and fixedly connect together the clasp member and the chain, when said jaws are moved together with a chain and clase member properly in place therein, said jaw sections defining a second recess positioned below said slots and operable to receive the terminal end portion of the clasp member when the passage portion is received in said open-ended slots.

4,219,920
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,348
Int. Cl.³ B23P 19/06
U.S. Cl. 29—407 5 Claims

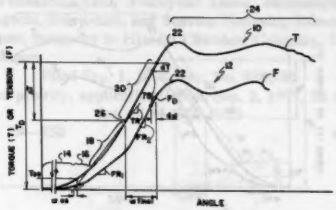
1. A method of monitoring the tightening of joints including at least one threaded fastener, comprising

tightening the fastener;

sensing the torque applied to and the angle of advance of the fastener;

terminating tightening in response to a first tightening parameter and calculating the stress in the joint;

calculating the stress in the joint from a second tightening parameter derived from the sensed values of torque and angle; and

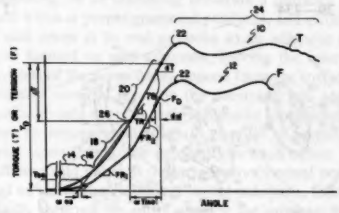


comparing the calculated stress from terminating tightening with the first tightening parameter with the calculated stress from the second tightening parameter.

4,219,921
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, which is a continuation-in-part of Ser. No. 712,554, Aug. 9, 1976, abandoned, and Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,361
Int. Cl.³ B23P 19/06
U.S. Cl. 29—407 5 Claims



1. A method for tightening a joint having a plurality of threaded fasteners, comprising

contemporaneously tightening the fasteners;

measuring the torque applied to the fasteners;

suspending threading movement of the fasteners thereby allowing the joint to relax;

after all of the fasteners have suspended tightening, resuming tightening of the fasteners for a final tightening angle increment measured from a location where the measured torque is at least equal to the torque existing immediately prior to the suspension of threading movement.

4,219,922
TENSION CONTROL OF FASTENERS

Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

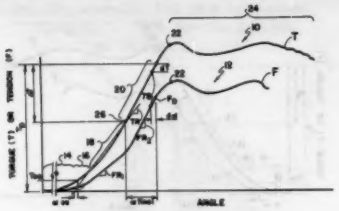
Division of Ser. No. 912,151, Jun. 2, 1978, Pat. No. 4,179,786, and Ser. No. 712,554, Aug. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 766,429, Feb. 7, 1977, Pat. No. 4,106,570. This application Apr. 19, 1979, Ser. No. 31,367
Int. Cl.³ B23P 19/06
U.S. Cl. 29—407 2 Claims

1. A method for monitoring the sequential tightening of a multiplicity of substantially identical joints including at least one threaded fastener, comprising

tightening the fastener beyond the yield point thereof;

sensing torque and not load applied to the fastener at various angles of advance; and

determining, from the sensed values, the stress appearing in the fastener at the termination of tightening at a stress



value adjacent the fastener yield point which stress differs from the nominal strength of the fastener and which varies from joint to joint.

4,219,923

WHEEL BRAKE ASSEMBLY

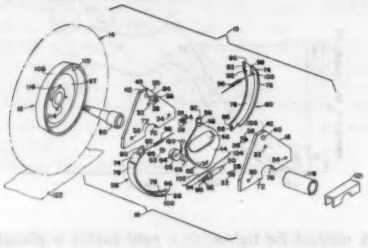
Milford F. Marti, 4001 Devon, Huntsville, Ala. 35802

Continuation of Ser. No. 796,346, May 12, 1977, Pat. No. 4,150,736, which is a continuation of Ser. No. 638,594, Dec. 8, 1975, abandoned, which is a continuation of Ser. No. 444,736, Feb. 22, 1974, abandoned. This application Apr. 20, 1979, Ser. No. 32,022

The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—434 **2 Claims**



1. The method of construction of a wheel brake assembly comprising:

stamping from a flat sheet material a single pair of generally delta-shaped flat plates and forming a semi-circular opening in one side edge of each plate, said side edge opening being generally opposite to an apex region of said plate;

with said flat plates spaced and parallel and aligned with said openings adjacent, installing a single anchor pin between plates near one corner region in a position opposite said openings, and installing between said plates means for selectively applying a force parallel to the side edge containing said openings;

rigidly fastening the thus formed flat plates in a fully spaced and parallel relation together, leaving a clearance for webs of brake shoes sufficient for movement of the webs but guided movement by and between said plates;

installing brake shoes with webs extending into and between opposite sides of said plates, and the webs of each being in engagement with said anchor pin;

installing a pair of springs on opposite sides of said plates and facing each other in a direction which is generally normal to a line extending between said anchor pin and the center of said semi-circular opening;

installing operating means reactively mounted on said plates for applying a force to the webs of said brake shoes; and

positioning said openings in said plates over an axle member having a like curvature to that of said openings and welding both said plates to said axle member.

4,219,924

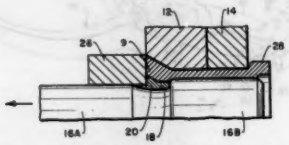
PROCESS FOR INSTALLING LOCK SPINDLE BLIND RIVET

Ralph R. Luhm, Brea, Calif., assignor to Allfast, Inc., City of Industry, Calif.

Division of Ser. No. 752,573, Dec. 20, 1976, Pat. No. 4,143,580. This application Aug. 28, 1978, Ser. No. 937,298

Int. Cl.³ B21D *39/00*; **B23P** *11/00*

U.S. Cl. 29—512 **8 Claims**



1. Process for installing a blind rivet comprising:

forming a stem having a forward section and a rear section separated by an annular locking groove;

forming an enlarged shoulder on the rear section of said annular locking groove;

mounting a rivet sleeve on said forward section;

said sleeve having a head at its forward end;

mounting deformable means on said forward section of said stem adjacent to said locking groove;

inserting said stem and rivet sleeve with said deformable means in a hole in a workpiece;

drawing said stem forwardly through said sleeve while maintaining said sleeve in said workpiece hole;

abutting the shoulder against a rear portion of the deformable means as the stem is drawn into the sleeve;

upsetting the rear end of said rivet sleeve with said deformable means and around an end of the hole;

swaging said deformable means into said locking groove;

drawing said deformable means with said stem substantially entirely through said sleeve, whereby said sleeve is deformed to fill said workpiece hole; and

breaking the forward end of said stem from the rear portion of said stem when said deformable means locks said stem and said rivet sleeve together at the forward end.

4,219,925

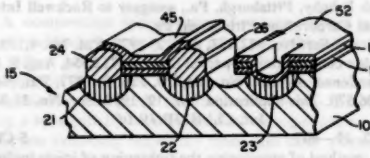
METHOD OF MANUFACTURING A DEVICE IN A SILICON WAFER

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Sep. 1, 1978, Ser. No. 939,141

Int. Cl.² B01J *17/00*

U.S. Cl. 29—578 **5 Claims**



1. A method of manufacturing a device in a silicon wafer (15) of a first conductivity type having formed thereon a masking medium (11) having an oxygen impervious exposed surface, masking and removing selected portions of the masking medium to expose the surface of the wafer to define at least one pair of spaced apart work sites (17, 18, 19), each of the work

sites being doped to form regions (21, 22, 23) of a second conductivity type, and placing an oxide layer (24, 26, 28) over the altered regions and over any other exposed surface capable of being oxidized, characterized by:

1—masking the surface of the wafer to define an electrical contact area over a selected portion of at least one of said second conductivity type regions;

2—removing that portion of the oxide in the defined area thus producing an opening (36) to the underlying doped region (23) whereby at least one wall of the opening is defined by an edge of said masking medium as previously defined by said first mentioned masking step and any remaining wall of the opening is defined by the oxide (28) formed over the doped region (23) as defined by said second mentioned masking step;

3—covering the entire exposed surface of the wafer with an oxygen impervious masking layer (44);

4—removing selected portions of the masking medium (11) and of the oxygen impervious masking layer (44) while retaining that portion of the masking layer (44) overlaying the doped region (23) defined by said opening, to define field regions (46, 48) whereat the wafer (15) is to be covered with a field oxide (49, 53);

5—forming a field oxide (49, 53) over the field regions of the wafer (15);

6—removing the remaining oxygen impervious surface regions (45, 52);

7—forming a conductor over the entire surface of the wafer; and

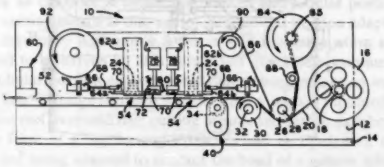
8—removing the conductor from all undesired portions of the surface to form a desired pattern of electrical interconnection which at least overlays a portion of the doped region defined by said opening.

4,219,926

METHOD AND APPARATUS FOR FABRICATING IMPROVED SOLAR CELL MODULES

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Joseph T. Bloch; Randolph T. Hanger, and Frank W. Nichols, all of Seattle, Wash.

Filed Feb. 23, 1979, Ser. No. 14,664
Int. Cl.³ H05K *3/34*
U.S. Cl. 29—832 **6 Claims**



1. In a method for fabricating a solar cell module, the steps comprising:

A. advancing a flexible strip having deposited on one face thereof electrical circuitry for electrically interconnecting solar cells;

B. depositing on said strip in overlying relation with said face a flexible strip of double-backed tape; and

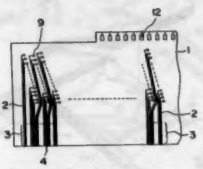
C. depositing on said face in engaged relation with said tape and said circuitry a plurality of similarly oriented solar cells arranged in side-by-side alignment.

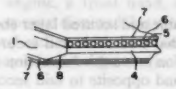
4,219,927

METHOD OF PRODUCING A MULTISTYLUS HEAD DEVICE

Naoki Fukutomi, Yuki; Yoshiyuki Tsuru, Shimodate; Kunio Kawaguchi, Shimodate, and Susumu Naoyuki, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 1, 1978, Ser. No. 938,784
Claims priority, application Japan, Sep. 2, 1977, 52-106188
Int. Cl.³ H05K *3/10*
U.S. Cl. 29—850 **4 Claims**





1. A method for producing a multistylus head device which comprises:

(1) disposing on an insulating substrate a plurality of insulated wires at preprogrammed positions, and affixing each of said wires at its end portions to an adhesive material layer formed on said substrate, leaving the intermediate portions of the wires freely spaced from the surface of the adhesive material layer on the substrate, and applying a tension to said wires in their respective longitudinal directions to arrange said wires in parallel at predetermined equal intervals in close proximity to each other;

(2) affixing said wires at their respective central portions to said adhesive material layer on the substrate, followed by fixedly securing the entire wires to the substrate by means of an overlay attached onto the surface of the adhesive material on the substrate;

(3) forming, in said substrate at its positions in which said end portions of the insulated wires are located, through-holes traversing crosswise the insulated wires, to thereby expose the resulting cut sections of the insulated wires respectively on the inner walls of the through-holes;

(4) electrolessly depositing metal layers respectively on the inner walls of the through-holes to collectively effect connection of said end portions of the insulated wires to the inner walls of the through-holes; and

(5) cutting the substrate along a line in which the insulated wires are disposed in parallel at their respective central portions to expose free terminals of the insulated wires on the edge of the substrate formed by the cutting, thus forming a plurality of electrodes disposed in parallel at the predetermined equal intervals in close proximity to each other.

4,219,928

FLAT CABLE AND INSTALLING METHOD

Ted L. C. Kuo, Fanwood, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

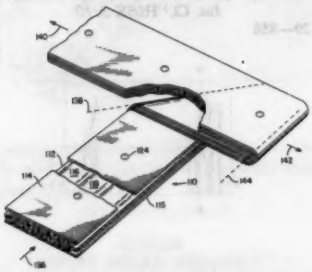
Filed May 25, 1979, Ser. No. 42,709
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—868 **8 Claims**

1. A method for laying flat multiconductor cable on a substrate in manner maintaining electrically-grounded overlayer protection therefor in the course of change in cable running

direction from a first direction to a second direction, comprising the steps of:

(a) securing to one side of said cable an electrically conductive layer and electrically ground-connecting said layer to said cable;

(b) laying said cable and secured layer on said substrate in said first direction with said cable interposed between said substrate and said secured layer;



(c) folding said cable and secured layer about a first fold line selected such that said cable and secured layer run from said first direction into a third direction different from said first direction and opposite to said second direction; and

(d) folding said cable and secured layer about a second fold line selected such that said cable and secured layer run from said third direction into said second direction.

4,219,929

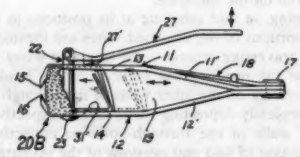
FINGER-TOE NAIL CLIPPER HAVING SHIFTING RECEPTACLE

Manki Min, 21-08, 28th Ave., Astoria, Long Island City, N.Y. 11102

Continuation of Ser. No. 858,022, Dec. 6, 1977, Pat. No. 4,150,481, which is a continuation-in-part of Ser. No. 680,377, Apr. 26, 1976, Pat. No. 4,062,109. This application Jan. 29, 1979, Ser. No. 7,318

Int. Cl.³ A45D *29/02*

U.S. Cl. 30—28 **10 Claims**



1. A finger-toe nail clipper having shifting receptacle, comprising a pair of horizontally disposed upper and lower elongated spring material strip members including forward and rearward end portions, which are respectively connected with each other by remarkably inclined opposing portions, and opposite longitudinal sides in each forward end portion thereof, said rearward end portions being rigidly joined together by suitable means and said forward end portions being slightly divergent and spaced apart for movement toward and away from each other, the forward terminal ends of said upper and lower strip members including downturned and upturned mating cutting edges, respectively, opposing each other and extending transversely of said forward end portions, thus forming in curved edges for neat trimming cut of nail portions therebetween, whereby a desirably defined space obtained between said divergent forward end portions of the strip members to receive a receptacle being shifting longitudinally for selective engagements of said receptacle to receive and discharge the cut-off nail portions, an upstanding post having a round head at its lower end disposed in slip-fit and being in journal in the vertically aligned two bores with said round head thereof beared against the opposing outside surface portion of the lower strip member, said two bores being opened respectively through the forward end portions of said strip members, an operating lever pivotally supported from the upper end of said post and being engageable with said upper strip member and swingable into and out of position operative to force said forward end portions of said strip members toward each other, thus bring said cutting edges into cutting engagement with each other, a longitudinally shifting receptacle for receiving and discharging the cut-off nail portions, said receptacle being comprised of wall means including an opposite longitudinal side walls of said receptacle and rear wall means being supported between said opposite longitudinal side walls to close the rear open side of said receptacle, thus providing a closing room immediately rearward of said cutting edges between said forward end portions of said strip members to receive the cut-off nail portions, a guide means provided with the opposing projected portions from said opposite longitudinal side walls and disposed to be guided along said opposite longitudinal sides of the strip members for longitudinal shift of the receptacle to provide a convenient way of selective engagements of the receptacle to receive and discharge the clip-off nail portions, a spring means being associated with at least one of said wall means and being engageable with at least one of said strip members to serve to maintain said closing room being in attitude to receive the clip-off nail portions in the varying defined space therebetween right behind of said cutting edges in its cutting engagement with each other, a positioning means being in combined relations with at least one of said wall and spring means for selective positions of the receptacle relative thereto between forward and rearward, active and inactive positions, respectively.

4,219,930

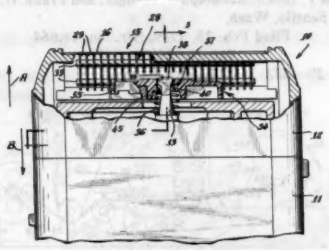
CUTTER HEAD ASSEMBLY FOR AN ELECTRIC DRY SHAVER

Joseph P. Franko, Milford, and Michael J. Marchetti, Bridgeport, both of Conn., assignors to Remington Products, Inc., Bridgeport, Conn.

Continuation of Ser. No. 759,933, Jan. 17, 1977, abandoned. This application Jul. 7, 1978, Ser. No. 922,878

Int. Cl.² B26B *19/02*

U.S. Cl. 30—43.92 **7 Claims**



1. An electric shaver comprising,

a. a flexible outer cutter and a movable inner cutter,

b. a member for supporting said movable cutter,

c. a drive slot having a pair of opposed endwalls and sidewalls formed in said support member,

d. spring means contacting said support member for urging said movable cutter in hair shearing contact with said outer cutter,

e. an elongated drive arm having a longitudinal axis and interconnected with said drive slot operable to dirve said support member and inner cutter in a reciprocatory path,

f. a drive head formed on said drive arm along said longitudinal axis, said drive head having an axis parallel to said reciprocatory path and also a lateral axis extending perpendicular to said reciprocatory path, said drive head having opposed parallel surfaces terminating at opposed rounded surfaces arranged along said parallel axis and engaging each of said endwalls in driving relationship, said parallel surfaces being arranged in spaced relationship to said sidewalls for allowing linear movements of said support member relative thereto along the longitudinal and lateral axes and rotational movements relative to the drive head along the longitudinal, parallel and lateral axes without loss of contact of said rounded surfaces with the engaged portions of the drive slot walls, and

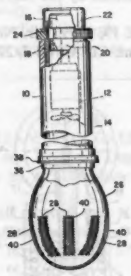
g. detent tabs formed on lower wall portions of the drive slot spaced from said engaged portions of the walls along said longitudinal axis and adapted for engagement with said rounded surfaces for limiting axial movement of the support member along said longitudinal axis and for release of the support member from the drive arm upon rotation with respect to said longitudinal axis whereby said detent tabs are rotated free of said rounded surfaces.

4,219,931

VACUUM HAIR TRIMMER

Silvano Vacilotto, 7955 Kipling Ave. North, Woodbridge, Ontario, Canada (L4L 1B3)

Filed Jan. 2, 1979, Ser. No. 633
Claims priority, application Canada, Jan. 4, 1978, 294301
Int. Cl.[2] B26B *19/44*
U.S. Cl. 30—133 **4 Claims**



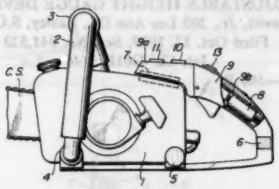
1. A portable, self-contained vacuum hair trimmer comprising a tubular portion providing a hollow handle adapted to be held by an operator, a motor mounted in said tubular portion, a hair cutting means at one end of said tubular portion adapted to be driven by said motor, a fan in said tubular portion also adapted to be driven by said motor and generate a vacuum in said tubular portion adjacent said hair cutting means so as to draw hair cuttings through said handle, a nozzle mounted at said one end over said hair cutting means, and said nozzle being in the form of a cap having sidewalls and an open end, said open end being adapted to contact the head of a person whose hair is to be cut, said nozzle providing a closed air path from said open end thereof to said tubular portion to ensure a maximum vacuum at said open end, said cap further being axially displaceable relative to said cutting means to gauge the length of hair left after cutting, a porous bag having a mouth detachably connected to the other end of said tubular portion to collect hair trimmings drawn therethrough, the mouth of said bag comprising a resilient cylinder which is squeezed into an annular recess at said other end of said tubular portion, and a bulbous plastic casing containing said bag, having windows for the exit of air from the bag.

4,219,932

CHAIN SAWING MACHINE

Akira Nagashima, Kawasaki, and Yasuo Saito, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Dec. 28, 1978, Ser. No. 973,843
Claims priority, application Japan, Dec. 28, 1977, 52/157384
Int. Cl.[3] B27B *17/02*
U.S. Cl. 30—381 **3 Claims**



1. In an improved portable chain sawing machine comprising an engine, a chain saw including a chain support and an endless chain provided with saw teeth thereon and adapted to be driven by said engine, a front hand, a rear handle, and vibration damping means disposed between said engine and said front and rear handles, said rear handle having an end connected to the top of said engine adjacent to the rear end thereof,

the improvement which comprises:

a substantially flat surface on top of said end of said end of said rear handle, wherein said flat surface forms an instrument board; and

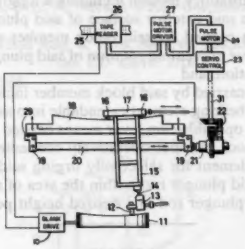
gauge means comprising at least one meter mounted on said instrument board.

4,219,933

DIFFRACTION GRATING RULING ENGINE

Toshiaki Kita, Hinodemachi; Shigeo Moriyama, Kokubunji, and Tatsuo Harada, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 10, 1979, Ser. No. 56,257
Claims priority, application Japan, Jul. 10, 1978, 53/83012
Int. Cl.[2] B43L *13/24*
U.S. Cl. 33—19 A **4 Claims**



1. In a diffraction grating ruling engine for mechanically ruling grating grooves on a spherical surface of a diffraction grating blank, the combination comprising: tool means for ruling grating grooves on the spherical surface of the diffraction grating blank, slide means for flexibly holding said tool means, cam means having a cylindrical arc surface with a circular arc part which defines a portion of a concentric circle with respect to a circular arc part of a grating blank section parallel to said grating grooves, feed means for feeding said diffraction grating blank a predetermined amount in a widthwise direction of said grating grooves, means for reciprocating said slide means in a lengthwise direction of said grating grooves in response to said feed means and with said cylindri-

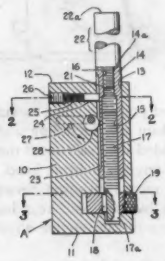
cal cam means as a guide, and displacement means for vertically moving said cylindrical cam means a distance which is a function of a radius of curvature of said diffraction grating blank and in correspondence with a grating groove position in the widthwise direction of said grating grooves as given by said feed means.

4,219,934

ADJUSTABLE HEIGHT GAUGE DEVICE

James J. Davitt, Jr., 203 Lee Ann Dr., Easley, S.C. 29640

Filed Oct. 12, 1977, Ser. No. 841,523
Int. Cl.[2] G01B *3/46*
U.S. Cl. 33—168 B **3 Claims**



1. An adjustable gauge device comprising:
a block member having at least one planar end face;
a first non-threaded bore formed in said block member having a smooth interior surface;
a reciprocating plunger rod having a smooth non-threaded exterior surface received in said first bore for sliding contact with said smooth interior bore of said block member;
an open-sided slot formed in said block member;
an turn screw member carried in said slot;
a threaded interior axial bore formed in said plunger rod;
a threaded lift screw member received within and threadably mating with said threaded interior bore of said plunger rod, said lift screw being keyed to said turn screw member so as to effect reciprocation of said plunger rod;
guide means for limiting the reciprocation of said plunger rod to translatory motion including a longitudinal groove formed in said exterior surface of said plunger rod and a guide pin carried by said block member extending into said groove preventing rotation of said plunger rod during reciprocation; and
lock means carried by said block member including a releasable cam bearing element extendable into said groove and manually operable cam lever means carried on an exterior of said block member operatively connected to said cam bearing element for selectively urging said cam element against said plunger rod within the area of said groove to lock said plunger rod in a desired height position.

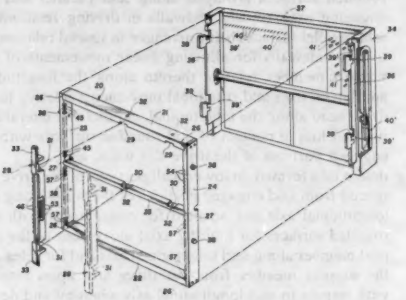
4,219,935

FIXTURE FOR USE IN ALIGNING MULTIPLE CONTACTS OF RECEIVER UNITS IN COMPUTER INTERFACE EQUIPMENT

Paul A. Braginetz, Staunton; Grady M. Powers, Mt. Sidney, and Kimball E. Stowers, Ft. Defiance, all of Va., assignors to Virginia Panel Corporation, Waynesboro, Va.

Filed Dec. 28, 1978, Ser. No. 973,959
Int. Cl.[3] G01B *3/30*
U.S. Cl. 33—174 R **15 Claims**

1. An alignment fixture for use in aligning contacts of receivers in computer interface equipment, comprising a rectangular fixture frame including a middle bar parallel to two members of the frame and extending between the other two members of the frame and fixed thereto, a releasably held movable fixture bar having at least two positions of use on the fixture frame and extending during use at right angles to the middle bar, interengaging means on the movable fixture bar, middle bar and on said frame and releasably holding the movable fixture bar selectively in any of its positions of use on the frame, and a



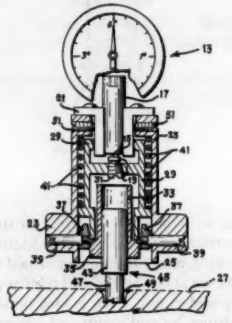
plurality of selectively independently usable contact alignment bars including means enabling them to be mechanically coupled releasably between one member of the frame and one side of the movable fixture bar in parallel relationship to the middle bar while the movable fixture bar is fixed in one position of use on said frame.

4,219,936

HOLE ANGULARITY GAGE

Thomas N. Bridges, Marietta, Ga., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1979, Ser. No. 77,235
Int. Cl.[3] G01B *3/22*
U.S. Cl. 33—174 Q **3 Claims**



1. A gage for measuring the angularity of the centerline of a hole in a workpiece with respect to a flat surface thereon comprising, in combination, a tapered pin in the hole and an angularity gage including a dial indicator calibrated in degrees and minutes, said dial indicator having a downwardly extending plunger slidably mounted thereon, a main housing having a flat annular lowermost surface for engaging the flat surface of the workpiece, an inner slide in operative contact with said dial indicator and slidably mounted in said main housing for vertical movement therein, an inner gimbal positioned in the lower portion of said inner slide, a disc portion on the lower end of said inner gimbal in operative contact with the lowermost end of said inner slide, an outer gimbal positioned in the lower portion of the main housing, said outer gimbal being pivotably connected to said main housing to allow free tilting movement of said inner gimbal relative to said main housing and biasing

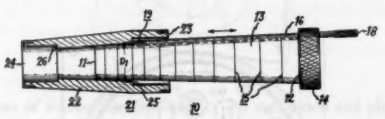
means for urging said inner slide downward against said disc portion of said inner gimbal whereby any tilting movement of said inner gimbal in response to angularity of the pin when the gage is placed over the pin in the hole causes a corresponding vertically upward movement of said inner slide thereby causing the dial indicator to indicate the angularity of the pin in degrees and minutes.

4,219,937

GAUGE FOR MEASURING INTERNAL DIAMETERS

Robert A. Lorenzini, Box 91, Hancock, Mass. 01237

Filed Aug. 31, 1979, Ser. No. 71,589
Int. Cl.³ G01B 5/12, 5/18
U.S. Cl. 33—178 B **13 Claims**



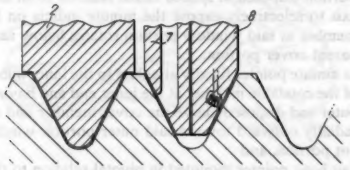
1. A gauge for measuring internal diameters comprising: a tapered cylindrical body portion for inserting within a passageway for contacting a wall portion of said passageway;
- a rod member moveably mounted on a surface of the cylindrical body for extending along said body and contacting a portion of said passage wall;
- a groove extending along said body for guiding said rod member;
- a raised portion on one end of said body to provide holding facility to said body; and
- a passageway extending through said raised portion for providing further guide means to said rod.

4,219,938

METHOD AND MEANS FOR GAUGING OF THREADS

Nils C. Tømmeraas, and Kolbjørn Legernes, both of Raufoss, Norway, assignors to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Jul. 6, 1978, Ser. No. 922,323
Claims priority, application Norway, Jul. 11, 1977, 772445
Int. Cl.² G01B 5/16
U.S. Cl. 33—199 R **3 Claims**



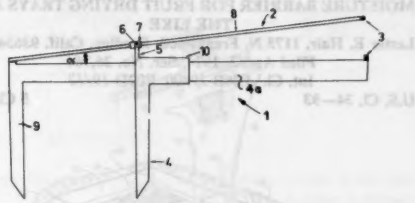
1. A method for determining defects in thread profiles, comprising the steps of:
- mounting a gauge roller in spaced relationship with a reference roller to enable radial movement of the gauge roller with respect to the reference roller;
- rolling the gauge roller and reference roller along a thread; and
- detecting the radial movement of the gauge roller with respect to the reference roller by the plurality of different areas of the gauge roller having correct profiles of parts of the thread groove with depressions between said profile parts.

4,219,939

METHOD AND DEVICE FOR SURVEYING THE BASAL AREA OF A FOREST STAND

Christer Turén, 4 Slädvägen, (S-902 35) Umeå, Sweden

Filed Jul. 19, 1978, Ser. No. 925,983
Claims priority, application Sweden, Jul. 27, 1977, 7706474
Int. Cl.² G01C 1/00, 15/00
U.S. Cl. 33—275 R **8 Claims**



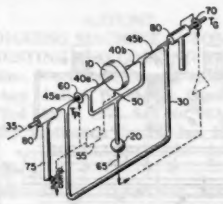
1. A method of surveying a forest stand of trees distributed around an observation point to determine its basal area per unit area of forest and its tree distribution with respect to diameter classes, comprising the steps of:
- locating a sight field marker at the observation point said sight field marker bearing a delineated sight field of predetermined size;
- measuring the diameter of each tree to be surveyed, preferably at a height of about 1.3 m. above ground level;
- establishing a sighting angle for each tree measured, the sighting angle being a function of the measured tree diameter, and setting the sighting angle on a viewing means;
- viewing the sight field on the sight field marker through the sighting angle set on the viewing means from a place spaced from the observation point by a distance equal to the spacing between the observation point and the measured tree, to determine if the sight field lies within the sighting angle; and
- recording the diameter of the measured tree if the sighting angle does not wholly encompasses the sight field.

4,219,940

ANGULAR ACCELEROMETER STABILIZED PENDULUM

Shigeo Okubo, 5412 N. Nevada #203, Colorado Springs, Colo. 80907

Filed Aug. 4, 1978, Ser. No. 930,850
Int. Cl.² G01C 9/06
U.S. Cl. 33—366 **15 Claims**



1. In a vertical indicating device having a Schuler-tuned pendulum, the pendulum having a rotational degree of freedom about a horizontal axis, the improvement comprising: an angular accelerometer having an axis parallel to the rotational axis of said pendulum; torsional coupling means between said angular accelerometer and said pendulum; means for generating an electrical signal representative of the relative angular velocity between said angular accelerometer and said pendulum; and means responsive to said signal for applying a restoring torque to said pendulum proportional to an acceleration associated to said relative angular velocity; whereby said pen-

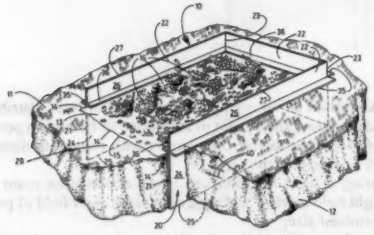
dulum has an effective moment of inertia substantially greater than its actual physical moment of inertia, such that its period of oscillation is that of a simple pendulum having a length equal to the earth's radius, whereby said pendulum maintains its alignment with the local gravity vector independently of horizontal acceleration.

4,219,941

MOISTURE BARRIER FOR FRUIT DRYING TRAYS AND THE LIKE

Lester E. Hair, 1175 N. Frankwood, Reedley, Calif. 93654

Filed Apr. 3, 1979, Ser. No. 26,764
Int. Cl.[3] F26B *19/00*; E02D *19/12*
U.S. Cl. 34—93 5 Claims



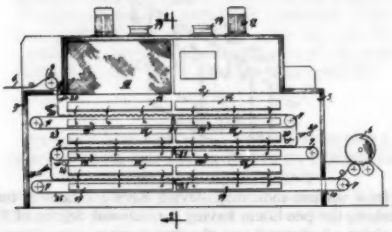
1. A moisture barrier for a fruit drying tray having a predetermined periphery and rested on soil sloped downwardly to a low side, the barrier comprising a continuous, substantially rigid panel of material substantially impervious to moisture and having three portions adapted to be folded relative to each other so as to be positionable in conforming relation to said periphery of the fruit drying tray with said portions received in the soil on which the tray is rested to obstruct the percolation of moisture through the soil beneath the tray and having a drain opening at the surface of the soil at a portion of the periphery of the tray nearest said low side to afford drainage for moisture on the tray.

4,219,942

CONTINUOUS DRYING CHAMBER

Luigi Coliva, Muggio', Italy, assignor to Essico S.r.l., Milan, Italy

Filed Jun. 5, 1978, Ser. No. 912,769
Claims priority, application Italy, Jun. 8, 1977, 24474 A/77
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—203 10 Claims



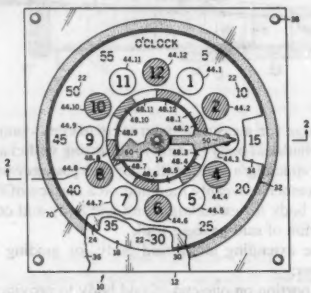
1. A continuous drying system for fabrics, comprising a drying chamber defining fabric inlet and outlet means, respectively, means for continuously introducing the fabric into said chamber and laying it on at least one continuous conveyor moving it to said outlet means; means for vibrating said at least one conveyor so that fabric laid thereon is stretched and laid out; a system for circulation of drying air comprising at least one fan unit having its delivery side connected through an air heating unit to at least one blowing channel overlying the fabric on the conveyor, and having its intake or suction side connected to at least one air sucking channel underlying the fabric and through said conveyor for keeping a circulation of a hot air flow passing through loops of the drying fabric, said air blowing and sucking channels, respectively, being provided with transverse air slits slantwise arranged to the fabric feeding direction.

4,219,943

TIME TEACHING CLOCK

T. Wayne Grimes, P.O. Box 388, St. Louis, Mo. 63166

Filed Sep. 28, 1978, Ser. No. 946,797
Int. Cl.[3] G09B *19/12*
U.S. Cl. 35—39 2 Claims



1. A time teaching clock comprising:

(a) a body including a pivot axis, said body including a base member having minute indicia recorded thereon in concentric relation about the pivot axis and a cover member fixedly attached to said base member and having hour indicia recorded thereon in concentric relation about the pivot axis and a transparent portion extending over said minute indicia said cover member having a coaxial circular opening,

(b) a rotatable member pivotally mounted to said body and disposed between said base member and said cover member, said rotatable member including an inner circular hub portion received within said central opening and an integrally formed outer portion having a window cut-out portion disposed in spaced radial relation from said pivot axis to selectively expose the minute indicia on the base member as said window portion rotates below said transparent cover portion,

(c) a minute pointer fixedly attached to the inner hub portion of the rotatable member at the inner end and having a free outer end disposed above the cover member and directed radially outward toward said outer portion window cut-out portion, and

(d) an hour pointer mounted in pivotal relation to the body member for rotatable movement relative to the hour indicia and independently of the rotatable member.

4,219,944

WALL MOUNTABLE ASTROLOGY SET

Joyce A. Keenan, Rte. 1, Box 5, Merkel, Tex. 79536

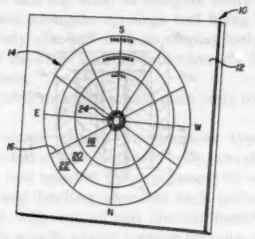
Filed Jun. 8, 1979, Ser. No. 46,930
Int. Cl.[3] G09B *29/00*
U.S. Cl. 35—44 1 Claim

1. Apparatus for practicing astrological science comprising, in combination:

a wall mountable board having a display surface and an astrology wheel representative of the zodiac delineated on

the display surface, said astrology wheel being partitioned into multiple sectors each embodying a house, and each house being partitioned into natal, progressed and transit regions;

a set of tokens representative of the signs of the zodiac constellations;



a set of tokens representative of the sun, moon and planets which traverse the zodiac;

a set of tokens representative of planetary aspect relationships within the zodiac; and,

said display surface and said tokens being characterized by mutually coacting surface portions which cause the tokens to releasably adhere to said display surface.

4,219,945

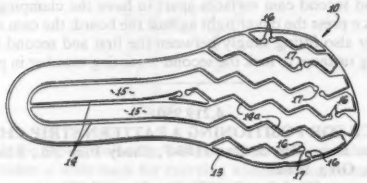
FOOTWEAR

Marion F. Rudy, Northridge, Calif., assignor to Robert C. Bogert, Woodland Hills, Calif., a part interest

Continuation-in-part of Ser. No. 830,589, Sep. 6, 1977, Pat. No. 4,183,156. This application Jun. 26, 1978, Ser. No. 918,790

Int. Cl.[2] A43B *13/20, 13/38*

U.S. Cl. 36—29 **25 Claims**



1. A structure to form part of a shoe, comprising a sealed sole member of elastomeric material providing a plurality of chambers, said chambers being inflatable with a gaseous medium under pressure to a desired initial value, and an elastomeric yieldable outer member encapsulating said sole member, said sole member having peaks and valleys in its upper and lower surfaces, the upper surface of said outer member being spaced above said peaks, said outer member extending downwardly from its upper surface to fill the space between said upper surface and said peaks and also to fill at least said valleys in said upper surface of said sole member, whereby the downward load of the wearer's foot is transmitted from said upper surface of said outer member through said outer member to the inflated chambers of said sole member.

4,219,946

SHOE WITH AN INTERCHANGEABLE HEEL

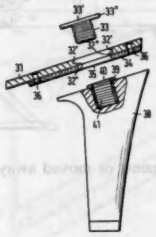
Uwe Baum, Rue Nanon 8,, 6060 Gilly, Belgium

Filed Sep. 14, 1978, Ser. No. 942,144

Claims priority, application Belgium, Sep. 15, 1977, 858729; Jan. 6, 1978, 862705

Int. Cl.[2] A43B *21/36, 13/28*

U.S. Cl. 36—42 **6 Claims**



1. A construction of shoes with interchangeable heels comprising:

a main sole having in a heel portion thereof a counter sunk circular hole comprising a lower portion of smaller diameter and an upper portion of larger diameter,

a reinforcing plate fixed on the lower side of the heel portion of said sole, said plate having a non-circular hole registering with but larger than the lower portion of said hole in said sole,

a heel having an upper surface fitting against the lower side of the heel portion of said sole, said heel having a tapped hole extending down from said upper surface and aligned with said hole in said sole,

a non-circular ferrule fixed to said heel and projecting up from said upper surface of said heel, said ferrule having an opening registering with said tapped hole in said heel and a non-circular outer periphery received in said non-circular hole in said plate to secure said heel against turning relative to said sole, and

a screw having a threaded shank received in said tapped hole in said heel and a head received in said upper larger portion of said hole in said sole, said screw extending through said holes in said sole and said plate and being screwed into said tapped hole in said heel to secure said heel removably and replaceably to said sole.

4,219,947

PLOW OR DIGGING MACHINE AUTOMATIC BLADE ADJUSTING AND LOCKING SYSTEM

Anthony Paladino, Woodstock, Canada, assignor to Eddy Oxford Enterprises Limited, Woodstock, Canada

Filed May 8, 1978, Ser. No. 903,676

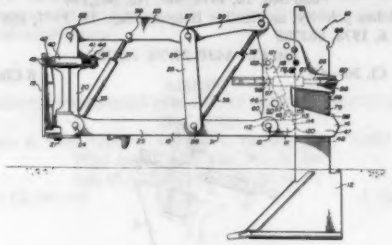
Claims priority, application Canada, Jan. 20, 1978, 295380

Int. Cl.[3] A01B *3/64*

U.S. Cl. 37—193 **17 Claims**

1. A plow apparatus for laying cable, pipe, tile, tubing and the like under ground comprising a blade mechanism having an upwardly extending support portion, a blade holder for connecting said support portion to a plow-pulling vehicle, said holder having an opening therein to receive said support portion, means for pressing said support portion against an interior surface of said holder in said opening, and means for locking said support portion in said holder at a selected height wherein the cutting depth of said blade mechanism can be adjusted, said locking means including a blade dog movably mounted on said blade holder and recesses formed on said support portion at various heights, one of said recesses being engaged by said dog in the locked position, wherein said pressing means includes an

arm pivotally mounted on said blade holder at one end of said arm and means for pivoting said arm so that the other end of



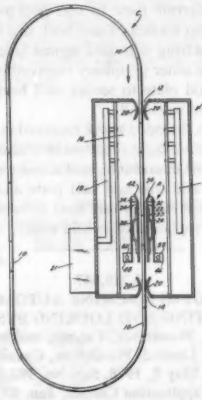
the arm is pressed against or moved away from said support portion as desired.

4,219,948

APPARATUS FOR PRESSING CLOTHING

Samuel Miranker, Brooklyn, N.Y., assignor to Automatic Steam Products Corporation, Long Island City, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,657
Int. Cl.³ D06F *69/02*; F26B *19/00*
U.S. Cl. 38—10 **34 Claims**



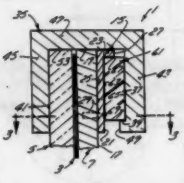
1. Apparatus for pressing an article of clothing or the like comprising a form upon which the article is carried, first and second pressing members each comprising a pressing surface, means for mounting said members in substantially parallel relationship with said surfaces facing each other, means for continuously moving said article carrying form along a path at least a portion of which passes between said surfaces, said members being movable, by the passage of said article carrying form therebetween, from a first position, wherein said surfaces are in relatively close proximity to each other, to a second position, wherein said surfaces are relatively separated from each other and wherein each of said surfaces engages a different side of the article to smooth and press same, respectively, and means for urging said members towards said first position.

4,219,949

PICTURE FRAME

Stanley E. McGurk, 697 Victoria Ave., Westmount, Quebec, Canada

Filed Dec. 13, 1978, Ser. No. 969,202
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—156 **1 Claim**



1. A picture frame comprising a sandwich made up at least of a rigid transparent cover and a rigid mounting board, a mounting unit, including a first mounting member having a first cam surface and a first locking surface generally perpendicular to the first cam surface; connecting means on the first mounting member to connect it and retain against movement to the back surface of the mounting board by an edge portion of the board with the cam surface facing away from the back surface of the board and with the locking surface facing inwardly from the edge portion of the board, the connecting means preventing movement of the first mounting member toward or away from the edge portion when the first mounting member is connected to the board;

a second mounting member having a second cam surface, a second locking surface adjacent and generally perpendicular to the second cam surface, and a clamping surface facing the second cam surface; the second member loosely fitting over the edge of the sandwich and the connected first mounting member at the edge portion of the board with the clamping surface adjacent the outer surface of the cover, the second cam surface facing the first cam surface and the second locking surface facing the first locking surface;

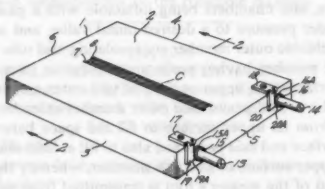
and at least one cam member having opposed side cam surfaces; the cam member insertable between the first and second cam surfaces, when the second mounting member is mounted over the connected first mounting member, to have the cam surfaces on the cam member wedge the first and second cam surfaces apart to have the clamping surface press the cover tight against the board; the cam member also fitting snugly between the first and second locking surfaces to lock the second mounting member in place.

4,219,950

DEVICE FOR POSITIONING A PATTERN STRIP CHART

Caroline Bays, Rte. 5, Box 1140-F, Shady Pine Rd., Klamath Falls, Oreg. 97601

Filed Jun. 5, 1978, Ser. No. 912,172
Int. Cl.³ G09F *11/18*
U.S. Cl. 40—518 **1 Claim**



1. A device for incremental positioning and display of an

embroidery chart of the type divided into minute squares, each approximately one-eighth inch square, with each square coded to indicate the color of yarn to be used for the corresponding stitch necessary to effect a specific embroidered pattern, said device comprising,

a main body including a top wall defining elongate openings through which the chart may pass for display of a chart segment on said top wall, an elongate chart support defined by said elongate openings and being of a width approximately one-half inch to display only a narrow segment of the chart bearing approximately four rows of chart symbols,

spindles rotatably mounted in said main body to receive the chart, and

latching elements of the two-position type pivotally mounted exteriorly on said main body, circular members carried by said spindles for engagement by said latching elements, said latching elements each including a tang engageable with one of said circular members to lock same and its spindle against rotation for purposes of retaining a chart segment displayed against accidental movement, each of said latching elements including an undercut edge to facilitate finger tip disengagement of same from a circular member.

4,219,951

FILE FOLDER WITH FASTENING MECHANISM ON THE INSIDE

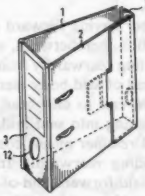
Otto Schmidt, Ronnenberg, Fed. Rep. of Germany, assignor to Dipl. Ing. A. Berglein, Hanover, Fed. Rep. of Germany

Filed Jan. 30, 1978, Ser. No. 873,097

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2747628

Int. Cl.[2] G09F *19/00*

U.S. Cl. 40—530 **6 Claims**



1. A file folder including: fastener means on the inside of said file folder; a wide back for carrying identification means; two covers extending from side edges of said wide back; a narrow back for carrying identification means connecting free side edges of said covers, said narrow back being formed on one of said covers holding said fastener means; a side edge strip reaching behind a free side edge of one of said covers; said narrow back being bent substantially at a right angle with said side edge strip as easly opened closure device such that said file folder during row-wise upright stacking on a shelf with a closed closure device forms a closed hollow element solidly enclosing contents with a horizontal cross-section; said file folder being placeable alternating said wide back and said narrow back for carrying identification; said file folder after opening said closure device being arranged in the usage position for storing and removal of individual file contents transversely to said fastener means.

4,219,952

INFORMATION CARRIER

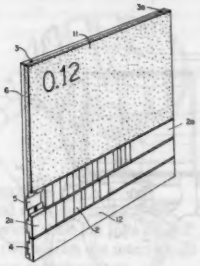
Wolfgang Flath, Viktoria Strasse 3, 8 Munchen 40, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,721

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 7721380[U]

Int. Cl.[2] G09F *7/10*

U.S. Cl. 40—622 **22 Claims**



1. An information carrier comprising:

a base plate, said base plate including at least one guide rail:

a plurality of blocks having the same height, said blocks including an information bearing face portion on one side and a guide strip on the reverse side, wherein said guide strip is adapted to be slidably matingly received within said at least one guide rail thereby mounting said blocks on said base plate and the face portion of said blocks has a square periphery and straight lateral edges;

a first groove located in said base plate adjacent at least one lateral edge portion extending perpendicular to the guide rail and substantially throughout the entire length of said base plate adjacent said lateral edge to the guide rail;

a second groove located in at least one of said blocks;

a locking means adapted to be inserted through said first and second groove wherein said locking means is completely sunk into said first groove means and prevents lateral movement of said blocks in at least one direction.

4,219,953

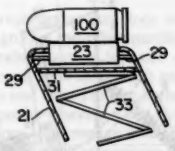
MAGAZINE STATUS INDICATING DEVICES

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Continuation-in-part of Ser. No. 952,698, Oct. 19, 1978, which is a continuation-in-part of Ser. No. 907,165, May 18, 1978, Pat. No. 4,142,313. This application Mar. 2, 1979, Ser. No. 17,039

Int. Cl.[3] F41C *27/14*

U.S. Cl. 42—1 B **7 Claims**



1. A magazine status indicating device comprising: a cartridge follower adapted for use in a magazine having a pair of lips with an exit port therebetween, said magazine including means to bias said follower toward said lips; and a cylinder loosely supported on said follower, said cylinder being positionally adapted to pass between said lips; whereby a cartridge positioned between said lips can prevent movement of said cylinder relative to said mounting means and whereby when

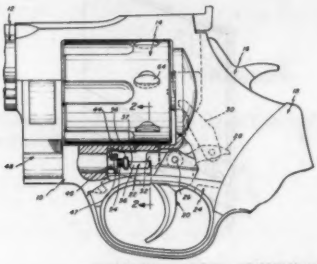
no cartridge is positioned between said lips said cylinder is free to rattle relative to said follower.

4,219,954

FIREARM

Paul E. Brouthers, Monson, Mass., assignor to D. W. A. Associates, Monson, Mass.

Filed Jul. 31, 1978, Ser. No. 929,571
Int. Cl.[3] F41C *1/00*
U.S. Cl. 42—67 **19 Claims**



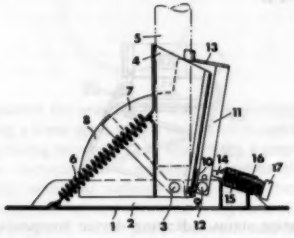
1. A firearm comprising;
a frame,
a trigger,
means mounting the trigger in the frame,
a bolt supported in the frame adjacent the trigger having pivot means at one end, a trigger-engageable end and locking lug means,
a cylinder mounted in the frame and having a plurality of cartridge-accommodating passages spacedly disposed along a circular locus having the passages centered along equally spaced respective cylinder radii,
said cylinder having a slot for receiving the lug means of the bolt, a slot being associated with each passage, but spaced away from the cylinder radius to the center of the passage,
said locking lug means comprising a substantially planar lug disposed at a relatively small angle to the vertical center plane of the frame.

4,219,955

AUTOMATIC HOOK-FISHING DEVICE

Giuseppe Lo Bosco, Via Donatello, 11, 20131 Milano, Italy

Filed Nov. 16, 1978, Ser. No. 961,227
Claims priority, application Italy, Jan. 25, 1978, 19596 A/78
Int. Cl.[3] A01K *97/12*
U.S. Cl. 43—15 **1 Claim**



1. A device for automatically carrying out the latching of the hook of a fishing rod which comprises a base plate, two parallel shoulders at the sides of the base plate, a tubular member, located in a vertical plane and positioned to house the end portion of the fishing rod, said tubular member being pivoted onto the plate and being connected at one end to a tension spring and being counterbiased at the opposite end by a rod effective to rotate in a vertical plane, said rod being provided with a tooth effective to engage with a suitable ridge formed, at a corresponding position, onto said tubular member, a pair of first circle sectors rigid with said tubular member and positioned at diametrically opposite positions, effective to define a protecting gap for said spring, said first circle sectors cooperating with a second pair of circle sectors fixed to the shoulders of the base plate, said first circle sectors being effective to rotate in the interior of the second pair of sectors and acting as stop members for the downwardly rotation of said tubular member, said rod being pivoted, at the lower end thereof, onto one of said side shoulders, said rod being provided at the top thereof with a circle arc shaped portion, effective to encompass the fishing rod, a pushing point resiliently biased by a second spring urging onto the lower portion of said rod, means for exerting pressure on said rod through said second spring, said means comprising a threaded bar and a knurled knob positioned for engagement with said second spring.

4,219,956

WEEDLESS CHANGEABLE PLASTIC LURE

Dean L. R. Hedman, 4410 NW. 61st St., Des Moines, Iowa 50322

Filed Mar. 22, 1978, Ser. No. 888,853
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.1 **9 Claims**

1. A weedless fish lure comprising,
a hook means having a shank portion with forward and rearward ends, a pointed arcuate hook portion with a rearwardly disposed barb element connected to the pointed end of said hook portion and the other end of said hook portion connected to said rearward end of said shank portion and an eyelet connected to said forward end of said shank portion,
a pliable body member having forward and rearward ends with a middle portion therebetween, and
retainer means extending rearwardly from said head element into the forward end of said body member to detachably secure said forward end to said head element with said hook portion extending into said middle portion of said body member, said retainer means comprising a first finger element extending rearwardly from said eyelet to engage the top of said forward end of said body member and a second finger element extending rearwardly from said head element and terminating in a forwardly disposed member extending into the forward end of said body member.

4,219,957

TRAVELING TOY

Takao Kakuta, No. 12-11, Okamura 4-Chome, Isogo-Ku, Yokohama-Shi, Kanagawa-Ken, Japan

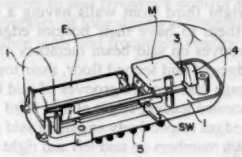
Filed May 31, 1978, Ser. No. 911,072
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 C **6 Claims**

1. A traveling toy comprising:
a base plate,
a proper frame which is disposed on said base plate,
a driving mechanism which is fixed to either of said base plate and said proper frame,
an eccentric vibrator which is secured to a front end of a

driving shaft of said driving mechanism and which is rotatably arranged,

a brush which is disposed on a lower surface of said base plate in a manner to incline slightly rearwards,

a steering mechanism mounted on a rear end part of said lower surface of said base plate, said steering mechanism



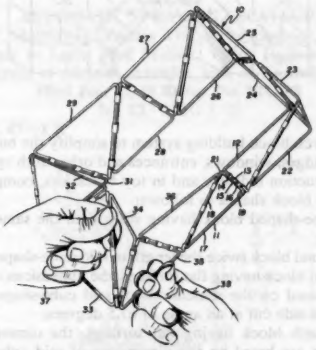
consisting of a plate which is pivotally supported in parallel with said base plate, a rubber member which is longer than bristles of said brush, which is flexible and which is protuberantly disposed at a rear end of said plate substantially perpendicularly to said base plate, and an operating knob which serves to turn said plate.

4,219,958

HINGEDLY CONNECTED TRIANGULAR ELEMENTS

Lev Shulyak, Worcester, Mass., assignor to Norman S. Blodgett, Worcester, Mass.

Filed Dec. 4, 1978, Ser. No. 966,114
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 R **6 Claims**



1. Construction apparatus, comprising:

(a) a first triangular element formed of a rod-like material,

(b) a second triangular element similar to the first triangular element having one side in contact with one side of the first triangular element,

(c) means connecting the two contacting sides, so as to permit relative rotation of the two triangular elements about an axis along the line of contacts of the said two sides, and

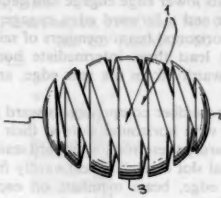
(d) a plurality of similar triangular elements similarly rotatably joined in alternate arrangement to form an endless band.

4,219,959

TOY EGG

Charles J. Fleischer, 8212 W. Norton Ave., Los Angeles, Calif. 90046

Filed Jun. 1, 1979, Ser. No. 44,522
Int. Cl.[3] A63H *33/00*
U.S. Cl. 46—1 R **8 Claims**



1. A toy comprising:

a first spherical shell cut into a helix;

a second spherical shell cut into a helix; and

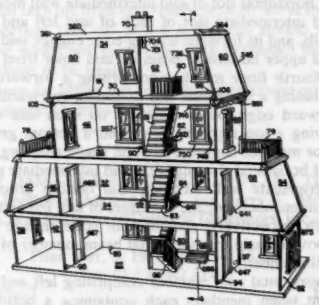
wherein said two helixes are intertwined with each other so as to produce an unitary toy.

4,219,960

DOLL HOUSE

Harry E. Walmer, 721 N. Overlook Dr., Alexandria, Va. 22305, and Judd Horbaly, 125 Commonwealth Ave., Alexandria, Va. 22309

Filed Feb. 16, 1978, Ser. No. 878,259
Int. Cl.[2] A63H *3/52*
U.S. Cl. 46—19 **10 Claims**



1. An easily assembled knock-down doll house, the parts of which are fitted together and held together with pegs comprising:

a. a generally rectangular first floor member comprising a center front groove and offset parallel left and right front grooves, parallel pairs of left and right grooves and a center groove parallel to said left and right grooves perpendicular to said front grooves in the top surface thereof;

b. a front wall member having a size and shape adapting it to have its bottom edge engage said center front groove of said first floor member, comprising vertical L-shaped side beams, a top horizontal beam member, upper and lower horizontal intermediate beam members on the inner front wall each containing a vertical slot and an inner groove, a doorway with door members disposed below said beam members, windows, and said bottom edge comprising a recessed portion parallel to the remaining portion thereof;

c. left and right side wall members having respective sizes and shapes adapting them to have their front edges engage said L-shaped beams of said front wall and their bottom

edges engage respective grooves of one said pairs of left and right grooves of said first floor, each of said side walls containing two intermediate horizontal slots extending forwardly from the rear edge, lower front vertical and upper front rearwardly angled beam members each having an inward side groove, doorways disposed on said bottom edge and between said horizontal slots;

d. intermediate wall member having a size and shape adapting it to have its lower edge engage said center groove of said first floor and a forward edge engage said vertical slots of said horizontal beam members of said front wall, comprising at least three intermediate horizontal slots extending forwardly from the rear edge, and an angled leading edge;

e. a second floor member comprising forward and recessed leading edges with horizontal slots at their juncture extending rearwardly therefrom, a forward stairwell including a horizontal slot extending rearwardly from said forward leading edge, beam members on each side edge having an angled top groove and a bottom groove, beam members on said recessed leading edges each having top and bottom grooves, said floor member having a size and shape adapting it to have its horizontal slots engage a said intermediate horizontal slot of said intermediate wall member and a said intermediate slot of each of said left and right side walls, and its forward leading edge engage said groove of said lower horizontal beam of said inner front wall;

f. a third floor member comprising forward and recessed leading edges with horizontal slots at their juncture extending rearwardly therefrom, a forward stairwell including a horizontal slot extending rearwardly from said forward leading edge, beam members on each side edge and said recessed leading edges each having a bottom angled groove, said floor member having a size and shape adapting it to have its horizontal slots engage a said intermediate horizontal slot of said intermediate wall member and a said intermediate slot of each of said left and right side walls, and its forward leading edge engage said groove of said upper horizontal beam on said inner front wall;

g. a fourth floor member comprising a forward stairwell including a horizontal slot extending rearwardly from its forward edge, beam members on each side edge each having a top angled groove and a bottom groove, said floor member having a size and shape adapting it to have said horizontal slot engage a said intermediate slot of said intermediate wall member, said bottom grooves of its beam members engage top edges of said left and right side walls respectively, and its front edge engage said inner groove on said top horizontal beam member of said front wall member;

h. a horizontal roof member comprising left and right and front beam members each containing a bottom angled groove, and a front roof side panel having L-shaped beam members on its left and right side edges, said front roof side panel having a size and shape adapting it to have its bottom edge engage a top angled groove in said top beam member of said front wall member and its inner surface abut said angled leading edge of said intermediate wall member, said horizontal roof member having a size and shape adapting it to have its said bottom angled groove of said front beam member engage the top edge of said front roof side panel and its bottom surface abut the top edge of said intermediate wall member, left and right side roof panels having a size and shape adapted to engage respective bottom grooves in said left and right beam members of said horizontal roof member and said top angled grooves of said side beam members of said fourth floor;

i. left and right second front walls having a size and shape adapting them to have their bottom edges respectively engage said offset left and right grooves of said first floor, their top edges respectively engage said bottom grooves of said beam members on said recessed leading edges of said second floor, their left edges respectively engage grooves on said vertical beam on said left and right side walls, and comprising L-shaped beam members on respective left and right side edges;

j. left and right second side walls each having a size and shape adapting them to have their bottom edges respectively engage parallel left and right grooves in said first floor, and their front edges to respectively engage said L-shaped beam members on said left and right second front walls;

k. left and right third front walls having a size and shape adapting them to have their bottom edges respectively engage grooves on said beam members on said recessed leading edges of said second floor, their top edges respectively engage said bottom grooves of said beam members on said recessed leading edges of said third floor, their left and right edges respectively engaging said groove on said angled beam members on said left and right side walls, and comprising L-shaped beam members on respective left and right side edges;

l. left and right third side walls each having a size and shape adapting them to have their bottom edges respectively engage angled grooves in said beams on said side edges of said second floor, and their front edges to respectively engage said L-shaped beams on said left and right third floor walls.

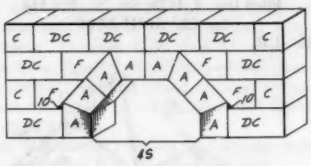
m. a plurality of pegs having respective sizes and shapes adapting them to be inserted in holes contained in said beam members grooves, walls and floor members at their junctures with each other for retaining said assembled structure together.

4,219,961

ARCH BLOCK BUILDING SYSTEM

Palmer Stiles, 635 Robin Way North, Satellite Beach, Fla. 32937

Filed Sep. 25, 1978, Ser. No. 945,419
Int. Cl.[2] E04B *1/32;* A63H *33/06;* E04C *1/24*
U.S. Cl. 46—24 R **2 Claims**



1. An arch block building system to simplify the building of arched bridges, windows, entrances and other arch systems in the construction industry and in toy block kits, comprised of four basic block shapes as follows:

a. a cube-shaped block having sides with the same dimensions;

b. a second block twice the length of said cube-shaped block;

c. a third block having flat surfaces, the dimensions of which are based on the dimensions of said cube-shaped block with a side cut at an angle of 67.5 degrees;

d. a fourth block having flat surfaces, the dimensions of which are based on the dimensions of said cube-shaped block with a side cut at an angle of 45 degrees.

4,219,962

TOY VEHICLE

Scott Dankman; Richard C. Levy, and Bryan L. McCoy, all of Silver Spring, Md., assignors to Scienco, Inc., Silver Spring, Md.

Filed Aug. 28, 1978, Ser. No. 937,132
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—232 **36 Claims**

16. A toy vehicle comprising:

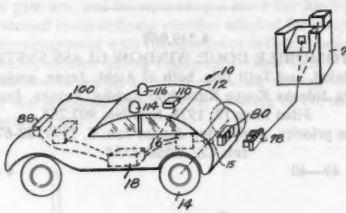
a body;

means, disposed on said body for generating a speed signal indicative of the speed of said body;

electronic means, disposed on said body, for generating an electrical engine noise simulation signal including:

a timing circuit, responsive to said speed signal and having a predetermined time constant, for developing a frequency control signal;

means, responsive to said frequency control signal, for generating a plurality of tone signals at respective frequencies in accordance with said frequency control signal;



combinatorial logic means, responsive to said tone signals and said control signal, for selectively generating said electrical engine noise simulation signal comprising a combination of respective tone signals in accordance with said control signal; and

means responsive to said control signal, for selectively changing said predetermined time constant;

said toy further comprising transducer means disposed on said body for generating audible output signals indicative of electrical input signals applied thereto and means for applying said engine noise simulation signal to said transducer means as an electrical input signal.

4,219,963

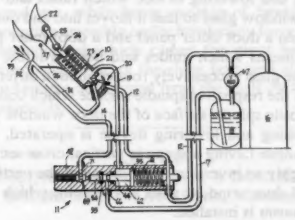
AUTOMATIC SPRAYING SECATEUR

Leslie F. Mullett, 29 Grantley Ave., Victor Harbour, Australia, assignor to Leslie Fred Mullett, Victor Harbour and The University of Adelaide, Adelaide, both of, Australia

Filed Jun. 12, 1978, Ser. No. 914,208

Int. Cl.[2] A01G *3/03*

U.S. Cl. 47—1 R **8 Claims**



1. A secateur comprising a pair of blades,

means retaining the blades for shearing movement relative to each other,

actuating means coupled to respective said blades and operable to effect said shearing movement,

a conduit terminating at one end in a spray emitting nozzle, and means securing the conduit near its said end with respect to one of said blades,

and spray impelling means operatively coupled to said actuating means and operable to effect emission of liquid spray from said conduit and through said nozzle upon reversal of said actuating means to a blade resetting position.

4,219,964

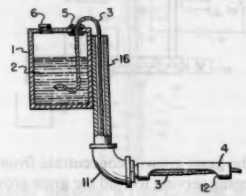
ROPE WICK APPLICATOR

Jim E. Dale, Greenville, Miss., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1978, Ser. No. 969,036

Int. Cl.[3] A01M *21/00*

U.S. Cl. 47—1.5 **5 Claims**



1. A rope wick applicator to dispense liquid agricultural chemical solution upon physical contact with foliage and plants comprising:

(a) reservoir containing agricultural chemical solution;

(b) a rope wick with one end extending down into the reservoir and immersed into said chemical solution, and the other end sufficiently long enough to extend out of the reservoir for a predetermined distance necessary to contact the foliage and plants to be treated;

(c) a rigid support boom supporting said rope wick, said rigid boom affixed to the reservoir, and comprising a vertical take off from said reservoir; a 90° ell at the end of the vertical take off and a horizontal slotted working section which will permit the wick to contact the foliage and plants to be treated;

(d) a means for filling and refilling said reservoir with liquid agricultural chemical solution.

4,219,965

FROST DAMAGE PREVENTION IN PLANT TISSUE

Hugh T. Freebairn, Manvel, Tex., and Jerry F. McDonnell, Norfolk, Va., assignors to Catalytic Generators, Inc., Norfolk, Va.

Filed Mar. 2, 1979, Ser. No. 16,875

Int. Cl.[2] A01G *13/00*

U.S. Cl. 47—2 **17 Claims**

1. The process of preventing frost damage to plant tissue comprising,

determining the HLB number of the plant tissue,

providing a treating composition having an HLB number within 3 units of the determined HLB number of the plant tissue,

said treating composition containing an oleaginous material and an emulsifyng agent,

applying said treating composition to said plant tissue in an amount sufficient to penetrate and swell the tissues to achieve frost damage prevention.

4,219,966

METHOD OF RAPID GRASS GROWTH

William J. McCalister, 646 Meadowood Dr., Broken Arrow, Okla. 74012

Filed Mar. 21, 1979, Ser. No. 22,525

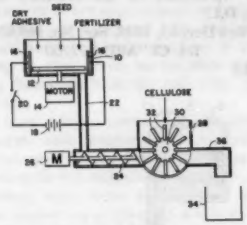
Int. Cl.[2] A01G *7/00*

U.S. Cl. 47—9 **10 Claims**

7. The method of starting grass growth on land comprising:

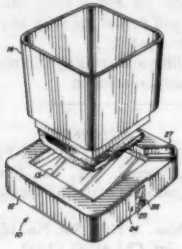
(a) mixing dry adhesive and grass seed in a blender;

(b) subjecting the mixture of seed and adhesive to an electrostatic charge to cause the adhesive to cling to the seed;
(c) adding fertilizer to the seed and grass mixture to form a grass growth concentrate;
(d) chopping cellulosic material into small particles and simultaneously feeding into the chopper a selected pro-



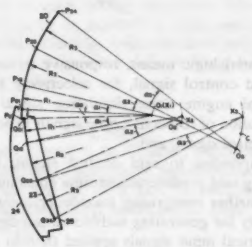
portion of the grass growth concentrate from step (c) the heat of chopping serving to bind the grass growth concentrate to the chopped cellulose to form a grass growth composition which remains evenly dispersed;
(e) blowing the grass growing composition onto the land to be planted; and
(f) watering the composition.

4,219,967
FLOWER POT WATERING APPARATUS
Norman E. Hickerson, Box 1148, Apopka, Fla. 32703
Filed Aug. 10, 1978, Ser. No. 932,531
Int. Cl.³ A01G *9/02*
U.S. Cl. 47—72 **1 Claim**



1. A flower pot watering apparatus comprising in combination:
a base having a float gauge formed therein, said float gauge having a transparent window and a floating sphere mounted behind said window to float with the level of liquid in said liquid reservoir;
a liquid reservoir in said base for holding a supply of liquid therein;
a flower pot container having a bottom portion shaped to fit over said liquid reservoir onto said base, said container being shaped to receive a flower pot therein and having the inside portion of said bottom portion formed to receive a fiber-pad, said bottom portion having an opening therethrough, and said flower pot container having a decorative shape to at least partially conceal a conventional flower pot therein;
a fiber-pad covering said bottom portion of said container and extending through said opening therein and into said liquid reservoir when said container is mounted thereover onto said base, said fiber-pad being folded a plurality of folds and stapled to hold said folded fiber-pad in a folded position, whereby a plant mounted in a conventional flower pot can be maintained by a separate flower pot watering apparatus;
guide members formed in said flower pot container for positioning a flower pot bottom portion onto said fiber-pad; and
said flower pot container bottom portion being formed to a predetermined shape for fitting into a predetermined opening in said base including said base having a top portion having an opening therein with internally protruding flanges, and said flower pot container having a bottom portion forming a ledge for fitting on the top of said base and being supported adjacent said internal flanges of said base.

4,219,968
AUTOMOBILE DOOR WINDOW GLASS SYSTEM
Yukio Sakai, and Teiji Iida, both of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed May 19, 1978, Ser. No. 907,753
Claims priority, application Japan, Jun. 8, 1977, 52-67445
Int. Cl.² E06B *3/34*
U.S. Cl. 49—40 **4 Claims**



1. A motor vehicle door window glass system comprising:
a door window glass which is formed in the shape of composite spindle surface wherein the composited spindle surface is formed by smoothly connecting together more than three spindle surfaces in a vertical direction such that the radius of curvature along any vertical section of the window glass decrease in downwardly direction, said window glass further being formed such that any horizontal section of said glass has a curvature which roughly corresponds to the curvature of the door panel on the exterior side of the belt line;
a raising and lowering device which raises and lowers the door window glass so that it moves into and out of a space between a door outer panel and a door inner panel; and
a guide means which guides said door window glass such that the glass successively rotates about a different central axis of the respective spindle surface which constitutes the composite spindle surface of the door window glass when the raising and lowering device is operated, said guide mechanism having a shape in vertical cross-section which is roughly an inversion of the shape of the vertical section of said door window glass at the point which said guide mechanism is installed.

4,219,969
PIVOTING BREAKAWAY COUPLING SYSTEM
Willard O. Reinitz, and Leland G. Phillips, both of Louisville, Ky., assignors to Safetran Systems Corporation, Louisville, Ky.
Filed Sep. 14, 1978, Ser. No. 942,365
Int. Cl.² E05C *15/02*
U.S. Cl. 49—141 **12 Claims**

1. A breakaway gate arm coupling system, for mounting to a gate arm control system having a support member which is

controllably raised and lowered, said gate arm coupling system comprising:

(A) a mounting adapter assembly securable to the support member of the control system and incorporating

(a) two supporting shelf portions

(1) formed on the underside of the mounting assembly,

(2) lying in substantially the same plane, and

(3) spaced apart from each other,

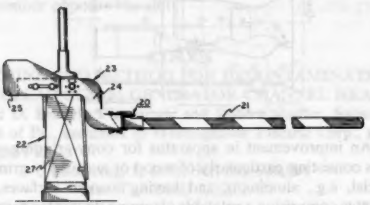
(b) a first pivot-defining member positioned between the two shelf portions,

(c) at least one, first aperture extending through the mounting assembly;

(B) a breakaway pivot assembly securely mountable to one end of the gate arm and incorporating a pivot bar having

(a) a second pivot-defining member adapted for cooperative interengagement with the first pivot-defining member for smooth, arcuate sliding engagement therewith,

(b) at least one second aperture extending through the pivot bar and alignable with the first aperture of the mounting assembly, and



(c) an overall length dimensioned for secure, supporting engagement with the shelf portions of the mounting assembly at opposed ends of the pivot bar when the first and second pivot-defining members are engaged and said first and second apertures are aligned; and

(C) shear bolt means

(a) positionable through the aligned first and second apertures and securable therein, for fastening the pivot bar to the mounting assembly, and

(b) having a shear stress limit above which said bolt splits along a shear plane transversely disposed to the central axis of the bolt, and

(c) responsive to a shear force produced by contact with the second aperture of the pivot bar when the pivot bar attempts to rotate;

whereby the gate arm is securely retained in its normal position during normal use, while being capable of freely dropping from the mounting assembly under breakaway force exceeding a predetermined level which causes the pivot bar to pivot about its pivot axis, shearing the shear bolt, and allowing the pivot bar to become disengaged from the shelf portions of the mounting assembly.

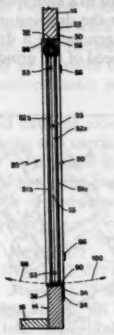
4,219,970

SWINGING DOOR UNIT FOR A DOGHOUSE

George J. DeGidio, 8600 5th Ave. South, Minneapolis, Minn. 55420

Filed May 14, 1979, Ser. No. 38,498
Int. Cl.[3] E05D 7/081
U.S. Cl. 49—388 10 Claims

1. A swinging door unit for a doghouse comprising a rectangular frame adapted to be mounted in a vertical wall of a doghouse, a door including first and second spaced sheet metal panels and a generally tubular sheet metal upper portion, said sheet metal tubular portion being integrally connected to the upper edges of said sheet metal panels, bearing means in said sheet metal tubular portion providing spaced cylindrical portions loosely received in encircling sections of said sheet metal tubular portion, and means engaging the sides of said frame near the upper ends thereof so that the spaced cylindrical sections of said bearing means rotatably journal said tubular



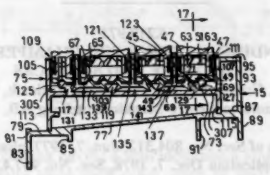
portion, whereby the door is free to swing in opposite directions.

4,219,971

POCKET WINDOW

Curtis Mauroner, 4709 Lake Villa Dr., Metairie, La. 70002

Filed Apr. 3, 1978, Ser. No. 892,504
Int. Cl.[2] E05D 13/02
U.S. Cl. 49—425 13 Claims



1. A sill assembly for a multisash pocket window having a sash that is horizontally movable and supported on rollers, said assembly comprising an elongated horizontally arranged insert retaining member having a plurality of parallel elongated and laterally spaced apart upstanding ribs which have a coplanar arrangement and cooperate in defining a plurality of elongated shallow recesses in the space therebetween, a plurality of elongated insert members which are arranged in the respective recesses and therein retained by the spaced apart ribs that cooperate in defining the respective recesses, and a pair of elongated horizontally arranged parallel rails which are spaced apart and arranged to therebetween and thereon support a supporting roller for said sash, at least one of said rails constituting an integral part of one of said insert members.

4,219,972

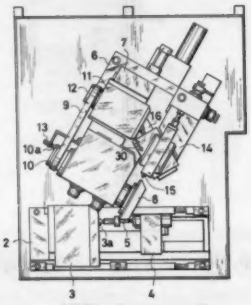
CONTROL APPARATUS FOR A GRINDING MACHINE

Masato Ota, and Kisaburo Koike, both of Narashino, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Filed Oct. 13, 1978, Ser. No. 950,996
Claims priority, application Japan, Oct. 17, 1977, 52/139008[U]; Oct. 17, 1977, 52/139009[U]; Oct. 17, 1977, 52/139010[U]
Int. Cl.[2] B24B 53/00
U.S. Cl. 51—5 D 6 Claims

1. A control apparatus for a grinding machine provided with a headstock to support a workpiece and to apply a rotatory force thereto, a wheel support having a grinding wheel effective to move against or away from a workpiece, and a variable

speed of revolution driving motor for rotating the grinding wheel, the control apparatus comprising: revolution speed changing means for selectively changing the speed of revolution of the driving motor to a high speed in the grinding operation or a low speed in the dressing operation; change signal generating means for generating a dressing command signal when the revolution speed of the grinding wheel is reduced to



a predetermined low revolution speed after the driving motor is turned off to thereafter initiate a dressing operation; and control means cooperative with said revolution speed changing means and said change signal generating means for enabling the driving motor to operate at the low dressing speed in response to selection of the low dressing speed and generation of the dressing command signal.

4,219,973

GRINDING MACHINE FOR CHAMFERING WORKPIECE END SURFACES

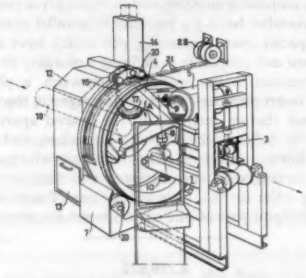
Bo Carlsson, Grabo, and Stig Johansson, Kullavik, both of Sweden, assignors to Centro-Maskin Goteborg AB, Gothenburg, Sweden

Continuation of Ser. No. 804,312, Jun. 7, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,430

Claims priority, application Sweden, Jun. 11, 1976, 7606680

Int. Cl.³ B24B *5/18*

U.S. Cl. 51—90 **6 Claims**



1. In a grinding machine for chamfering the end surfaces of an elongated workpiece, said machine having a rotatable grinding wheel carried on a pendulum which is in turn pivotally supported on a pendulum mounting, said pendulum mounting being rotatable in order to move said pendulum and the grinding wheel carried thereon around the longitudinal workpiece axis, the improvement comprising said pendulum being pivotally movable about an axis which is parallel to the rotational axis of the grinding wheel and which traverses the rotational axis of the pendulum mounting, the pendulum mounting having an opening through which the workpiece may be moved longitudinally along its axis, thereby enabling both ends of the workpiece to be chamfered by the grinding wheel without reversing or turning the workpiece.

4,219,974

COPY-GRINDING APPARATUS

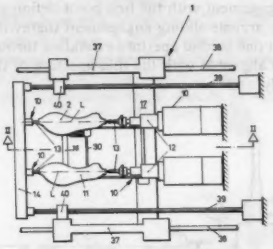
Erich Schmidt, Wien, Austria, assignor to Maschinenfabrik Zuckermann Komm. Ges., Vienna, Austria

Filed May 11, 1978, Ser. No. 905,287

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721244

Int. Cl.² B24B *5/16, 21/16*

U.S. Cl. 51—101 R **11 Claims**



1. An improvement in apparatus for copy-grinding workpieces consisting particularly of wood or a similarly grindable material, e.g., aluminum, and having uneven surfaces, said apparatus comprising a rotatable clamping device for receiving a workpiece therein, at least one driven grinding tool positively controlled by a scanning roller scanning a master model and advanceable along the workpiece in the direction of the axis of rotation of the clamping device by an advance mechanism, and means for rotating the master model about an axis of rotation, wherein the workpiece has wave-shaped, concave surface areas extending generally transversely to the axis of rotation of said clamping device, the improvement comprising means for mounting the grinding tool for pivotal movement about an axis generally normal to the axis of rotation of the clamping device, means for mounting said scanning roller for pivotal movement about an axis generally normal to the axis of rotation of the master model and means coupling said grinding tool to said scanning roller for transmitting a selected angle of attack of said grinding tool.

4,219,975

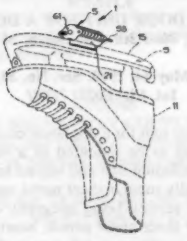
SKATE SHARPENER

Martin Scholler, 400 Marie-Victorin, Boucherville, Quebec, Canada (J4B 1W2)

Filed Nov. 28, 1978, Ser. No. 964,368

Int. Cl.³ B24B *9/04*

U.S. Cl. 51—205 WG **7 Claims**



1. A skate sharpener comprising:

a cylindrical sharpening member;

a holder having two symmetrical members for holding the sharpening member between them, each holding member having means on one side which, when the sides are positioned adjacent each other, define a skate-blade receiving slot along the length of the holder said slot extending radially of the sharpening member;

means for mounting the holding members about the sharpening member so that said holding members can be moved toward or away from each other to vary the width of said slot; and

means for retaining the sharpening member centered with respect to said slot when the width of the slot is varied;

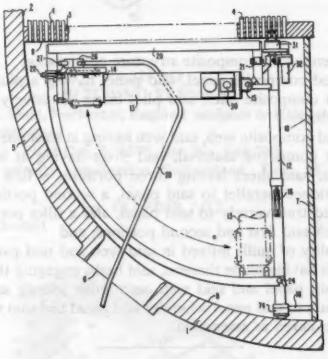
said retaining means including cam elements on said holding members to cam the sharpening member toward said slot when the holding members are moved apart, said cam elements comprising curved fingers on each holding member, extending from the other side of each holding member, over the surface of the sharpening member opposite said slot, to the other side of the other holding member, the fingers on both holding members meshing with each other to substantially cover the surface of the sharpening member opposite the slot.

4,219,976

MACHINE AND METHOD FOR DECONTAMINATING NUCLEAR STEAM GENERATOR CHANNEL HEAD

Robert D. Burack, Pittsburgh, and Robert Shaffer, Swissvale, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1978, Ser. No. 930,091
Int. Cl.[2] B24C *3/32, 1/00*
U.S. Cl. 51—411 **8 Claims**



1. A decontamination machine for decontaminating substantially all of the interiorly facing walls on one side of a divider wall in a channel head of a nuclear steam generator having a manway, comprising:

a first assembly comprising a vertical post and a carriage track carrying a movable carriage, said carriage track being pivotally secured to the upper end portion of said post to permit the assembly to be collapsed to a size permitting entry through said manway into said channel head, said assembly being sufficiently lightweight to permit the manipulation and installation thereof in said channel head by no more than two individuals in a location in which said vertical post is closely adjacent the vertical center line of said divider wall;

a horizontal support beam including fastener means at its radially inner end adapted to be separably secured to the upper end portion of said vertical post;

a curved track shaped to complete a generally quadrantal shaped frame also including said post and said beam, said curved track means including fastener means at both ends adapted to be separably secured to the radially outer end of said horizontal beam and the lower end portion of said vertical post, said curved track engaging the outer end of said carriage track in movable relation;

both said beam and said curved track also being sufficiently ligthweight to permit their manipulation and attachment to said first assembly by no more than two individuals;

adjustable decontamination blaster means attached to said carriage; and

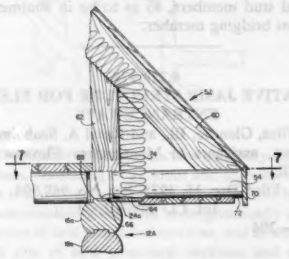
means for moving said carriage along said carriage track, and means for swinging said carriage track both horizontally and vertically so that said decontamination means has the capability of sweeping past substantially all said interiorly facing walls of said channel head.

4,219,977

LOG BUILDING CONSTRUCTION

Robert Bene, Andover; Joseph A. Fortini, and Maximiliano Giacomini, both of New Haven, all of Conn., assignors to Country Log Homes, Inc., Ashley Falls, Mass.

Filed Jun. 23, 1978, Ser. No. 918,564
Int. Cl.[2] E04B *1/10*
U.S. Cl. 52—94 **14 Claims**



10. A log building having a wall including a plurality of logs laid horizontally upon each other, each of said logs having upper and lower surfaces, a tongue projecting above said upper surface and extending longitudinally of the log, and a groove opening through said lower surface and extending longitudinally of said log in parallel relation to said tongue, said groove in each of said logs receiving therein said tongue of an adjacent log immediately therebelow, a plurality of horizontally spaced joists supported on the upper log course of said wall and extending therebeyond in cantilever position, said logs including a plurality of filler logs, each of said filler logs extending between a pair of adjacent joists, and a soffit secured to outwardly extending portions of said joists and having an inner marginal edge portion resting on an associated portion of the upper surface of one of said logs and a vertically disposed inwardly facing inner edge engaging an associated side surface of a tongue on said one log.

4,219,978

PRE-CAST REINFORCED CONCRETE BUILDING PANEL WALL STRUCTURE

Billy R. Brown, 12000 Barracks Rd., Louisville, Ky. 40219

Filed Aug. 3, 1978, Ser. No. 930,495
Int. Cl.[2] E04G *21/00*; E04B *1/38*
U.S. Cl. 52—125 **11 Claims**

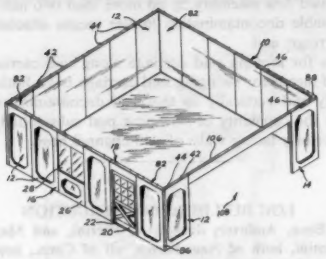
1. A preformed structural wall including at least two modular sections disposed in edgewise butting relationship, each section having:

a. a pre-cast reinforced concrete panel of generally rectangular shape with at least two integral reinforcing stud members extending upwardly from the top edge thereof;

b. the vertical side edges of adjacent panels having mating

surfaces forming an interlocking connection therebetween, and sealing means present in the connection for waterproffing the joint;

c. the bottom edge of each panel being adapted to be seated in an elongated groove of a supporting member so as to



align the panels, and sealing means present in the groove for waterproofing the joint and supporting the panel;

d. an elongated bridging member that spans only two adjacent panels and is attached to both panels by means of the integral stud members, so as to be in abutment with an adjacent bridging member.

4,219,979

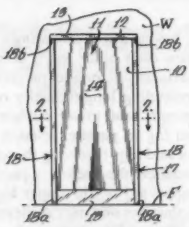
DECORATIVE JAMB STRUCTURE FOR ELEVATOR ENTRANCEWAYS

Bradford Wiles, Glencoe, Ill., and Reuel A. Seaholm, Arkansas City, Kans., assignors to Montgomery Elevator Company, Moline, Ill.

Filed Dec. 15, 1978, Ser. No. 969,994

Int. Cl.[2] E06B *1/04*

U.S. Cl. 52—204 **5 Claims**



1. A decorative jamb for a side of an entranceway that extends through a wall between an elevator hatchway and a building corridor having a floor structure, so that the sides of the entranceway are defined by end surfaces of the wall, there being a decorative top cross structure in the entranceway and a sliding door in the hatchway which normally closes said entranceway, said decorative jamb comprising, in combination:

a decorative shroud structure which has a lower end at the floor structure and an upper end at the top cross structure of the entranceway to conceal the end surface of the wall, said shroud structure having two vertical side elements which are joined by recessed connecting web means to define a vertically extending central channel;

a retaining flange which cooperates with the connecting web means of the shroud structure to define a downwardly open pocket at the upper end of the central channel;

a finishing plate in the lower end portion of said central channel, said finishing plate comprising a core which has an upper end and a decorative sheath which has a top margin above said upper end and cooperates with said connecting web means to define an upwardly open pocket;

fasteners detachably securing said finishing plate to the shroud structure;

and a decorative panel in said channel with its end portions snugly seated in said pockets, the length of said decorative panel being greater than the distance from the top margin of said decorative sheath to the top of the downwardly open pocket, whereby said decorative panel may be removed only by first removing the finishing plate.

4,219,980

REINFORCED COMPOSITE STRUCTURE AND METHOD OF FABRICATION THEREOF

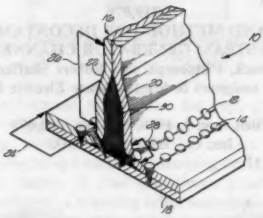
Morris S. Loyd, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 828,122, Aug. 26, 1977, Pat. No. 4,109,435. This application Aug. 21, 1978, Ser. No. 929,136

The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.

Int. Cl.[2] E04C *2/02*

U.S. Cl. 52—309.1 **17 Claims**



1. A reinforced composite structure comprising:

a staged composite panel, said panel having a plurality of fiber composite plies, said plies being adhesively bonded together;

a staged composite web, said web having at least one sheet of fiber composite material, said sheet having at least one layer, said sheet having three portions, a first portion positioned parallel to said panel, a second portion positioned transversely to said panel, and a fillet portion between said first and second portions; and

a plurality of quills infixed in said web and said panel, said quills having barbs thereon, said barbs engaging the fibers of said panel and said web, said quills joining said fillet portion to said panel whereby said panel and said web can be co-cured as assembled.

4,219,981

REINFORCING STRUTS FOR ROOFING TILES

James L. Stewart, and Raymond G. Owers, both of Auckland, New Zealand, assignors to Ahi Operations Limited, Auckland, New Zealand

Filed Sep. 11, 1978, Ser. No. 941,052

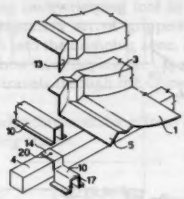
Claims priority, application New Zealand, Sep. 19, 1977, 185207

Int. Cl.[2] E04D *3/30*

U.S. Cl. 52—478 **2 Claims**

2. A roof including: a plurality of spaced apart tile battens extending across the roof; a plurality of reinforcing struts connected to said tile battens; each reinforcing strut consisting of an elongate channel member of top-hat cross section having an upper face, two downwardly depending sides, and side flanges extending outwardly from said sides, and an upturned flange at one end of the upper face thereof, a locating tab on said flange substantially parallel to said upper face and extending away from said upper face thereof, the other end of the channel member being open to receive a tab of an adjacent

reinforcing strut; the reinforcing struts being connected to said tile battens in stepped formation with each locating tab being connected to an upper surface of the tile batten, with adjacent reinforcing struts being positioned in line by inter-engagement of adjacent locating tabs and open ends; and a plurality of tiles each tile having stepped leading and trailing edges and recesses adjacent their side edges; said reinforcing struts being spaced



apart to coincide with said recesses adjacent the side edges of said tiles; said tiles being attached to said roof and positioned with their side edges overlapping and supported by said struts coinciding with said recesses; the trailing edge of each tile resting on a tile batten and covering the locating tabs of said struts, and the leading edge of each tile extending over the open ends of said struts and covering the trailing edge of the next adjacent tile.

4,219,982

BUILDING ELEMENT

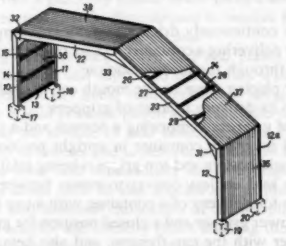
Michael G. Hart, Rochester, England, assignor to Relocator AG, Zug, Switzerland

Filed Oct. 5, 1978, Ser. No. 948,793

Claims priority, application Switzerland, Dec. 15, 1977, 15429/77

Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—641 **9 Claims**



1. A building element comprising two spaced parallel support posts and bracing means connecting said support posts, two parallel rafters secured together in spaced relationship corresponding to the spacing of the support posts and associated one with each support post and connecting means connecting each support post to the associated rafter, with the direction of length of the support post and the associated rafter substantially in a common plane, the connecting means being slidable in the direction of length of the associated rafter and permitting pivotal movement of the associated support post relative thereto in the common plane.

4,219,983

HEAT-INSULATED STRUCTURAL SECTION ASSEMBLY

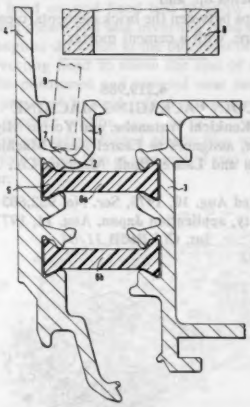
Horstmar Kern, and Helmut Botzenhardt, both of Ulm, Fed. Rep. of Germany, assignors to Wieland-Werke Aktiengesellschaft, Ulm, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,456

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2755695

Int. Cl.[3] E04C *3/30*

U.S. Cl. 52—730 **1 Claim**



1. In a heat-insulated structural section assembly for window and door frames, consisting of an inner and an outer structural metal section transversely connected to each other by at least one plastic heat-insulating bar held in longitudinally extending opposite grooves of said structural sections, and at least one leg integral with one of said structural sections and extending generally parallel to the plane defined by the panel to be set in the window or door frame, said leg integrally extending from the terminal end of a flange partially defining the groove in said one structural section, and said groove-defining flange being forced under pressure by a pressure roller onto said heat-insulating bar, the groove-defining flange having a thickened portion which extends along the entire length of the structural section assembly, wherein the improvement comprises the feature that the thickened portion is located on the on the said leg on the side contacted by the pressure roller and facing away from said insulating bar.

4,219,984

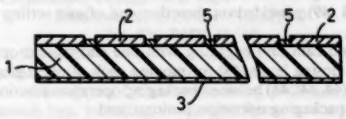
METHOD OF MANUFACTURING BUILDING PANELS

Maurice G. de San, Rte. Gouvernementale, 174, 1950 Kraainem, Belgium

Filed Nov. 30, 1978, Ser. No. 965,210

Int. Cl.[2] E04C *1/00*

U.S. Cl. 52—741 **1 Claim**



1. A method of manufacturing wall panels comprising a core of rigid cellular material having spaced apart thin brick elements bonded to one face thereof and a backing plate on the opposite face thereof, the method comprising the steps of:

placing the brick elements, face down, in the desired relation on the bottom of a mold;

filling the gaps between the brick elements with a mixture of a finely powdered material and a catalyst or accelerator for the foaming reaction of the plastic material which will form the rigid cellular core;

forming said rigid core by injecting the said plastic material to be foamed into the mold over the back of the brick elements and the layer of said mixture between the brick elements, and permitting the foaming reaction to be completed with the backing plate on the back face of the core;

demolding the panel and placing it on the backing plate, brick elements up; and

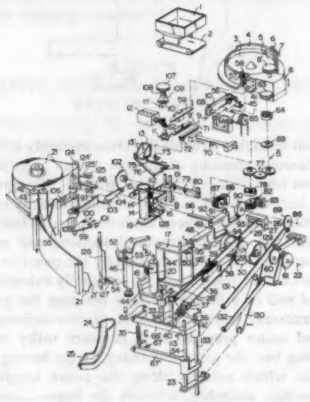
filling the gaps between the brick elements, cleared from the said mixture, with a cement mortar.

4,219,985

COIN PACKAGING MACHINE

Isamu Uchida; Kenkichi Watanabe, and Yorizo Miyazaki, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan and Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,603
Claims priority, application Japan, Aug. 11, 1977, 52-96417
Int. Cl.[2] B65B *11/04*
U.S. Cl. 53—212 **1 Claim**



1. A coin packaging machine in which distances between coins to be packaged and each of packaging rollers in non-packaging operation position are simultaneously adjusted in accordance with the kind of coins to be packaged which comprises:

a setting shaft (**86**) set at a given angle in accordance with the kind of coins,

a first cam (**90**) mounted on said setting shaft (**86**),

a setting lever (**92**) rotatable about a shaft (**91**) positioned between its opposite ends and engaging at the one end thereof with said first cam (**90**),

an opening and closing lever (**48**) rotatable about a rotary shaft (**49**) provided on the other end of said setting lever (**92**),

a second cam (**39**) engaging with one end of said opening and closing lever (**48**) for moving each of packaging rollers (**44**, **44'**, **46**) between packaging operation position and non-packaging operation position, and

a link member (**17**) operatively associated with the other end of said opening and closing lever (**48**) and operatively connected to each of packaging rollers (**44**, **44'**, **46**),

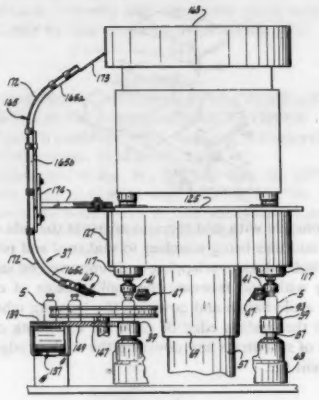
whereby distances between coins to be packaged and each of packaging rollers in non-packaging operation position are simultaneously adjusted by setting said setting shaft at a given angle.

4,219,986

CAPPING APPARATUS

Joseph C. Osterhaus, Port Jefferson, N.Y., assignor to Perry Industries, Inc., Hicksville, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,602
Int. Cl.[2] B65B *7/28*; B67B *3/064, 3/18*
U.S. Cl. 53—314 **29 Claims**



1. Apparatus for applying caps to containers such as glass vials or bottles, the containers being of the type having a neck and a flange on the neck at the mouth end thereof, and the caps being of the type having an annular skirt adapted to surround the flange and to be crimped under the flange, said apparatus comprising:

endless conveyor means;

a series of sets of grippers carried by the conveyor means spaced at equal intervals therearound, each set being adapted to grip a container at the top and bottom of the container;

said conveyor means being movable to move the sets of grippers through an endless generally horizontal path with containers held in an upright position, and to carry each set of grippers from a loading station where a container with a cap thereon is delivered to the set through a crimping zone for crimping the cap and thence to an unloading station where the container is unloaded from the set;

means for continuously driving said conveyor means;

means for delivering a container to a set of grippers as the set travels through the loading station;

means for placing a cap on the mouth end of each container prior to its delivery to a set of grippers;

each set of grippers comprising a bottom and a top gripper adapted to grip a container in upright position therebetween, said bottom and top grippers being relatively movable on said endless conveyor means between an open position for delivery of a container with a cap thereon on to the lower gripper and a closed position for gripping the container with the cap thereon, and also being rotatable relative to the conveyor means;

means for continuously rotating the top grippers as the conveyor means carries the sets of grippers through said endless path for rotating the containers and the caps thereon;

means for effecting relative movement to closed position of the bottom and top grippers of each set of grippers as the set travels away from the loading station, for holding them closed as they travel through said crimping zone, and for effecting relative movement to open position of the bottom and top grippers of each set as the set travels out of the crimping zone to the unloading station,

a series of cap crimping tools, one for each set of grippers, carried by the conveyor means;

each of said crimping tools being mounted on the conveyor means for movement from a retracted position spaced from a cap on the container gripped in the respective set of grippers to a crimping position in crimping engagement with the skirt of the cap for crimping the skirt under the flange of the container;

means for moving each crimping tool to its crimping position as the respective set of grippers moves from the loading station into the crimping zone, holding the tool in crimping position for crimping the cap on the container as the container travels through the crimping zone and then retracting it;

and means for unloading containers from the sets of grippers at the unloading station.

4,219,987

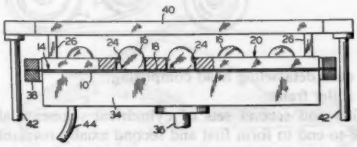
METHOD FOR SKIN PACKAGING USING PLATEN FORMING OF THE FILM, AND PACKAGES PRODUCED THEREBY

James V. Hannon, New Britain, Conn., assignor to Diversified Packaging, Incorporated, Kensington, Conn.

Division of Ser. No. 801,097, May 26, 1977, Pat. No. 4,145,863. This application Mar. 26, 1979, Ser. No. 24,064

Int. Cl.³ B65B *11/52*

U.S. Cl. 53—427 **6 Claims**



1. In a method for encasing articles between a substrate and a deformable plastic film, the steps comprising:

a. supporting on a bed platen a substrate having a plurality of articles spaced about the upper surface thereof:

b. heating a length of theremoplastic film to a temperature at which it will deform under pressure;

c. supporting said heated thermoplastic film is a substantially linear configuration above said bed platen, substrate and articles;

d. providing a pressure platen having above said supported heated film a generally planar lower surface with a plurality of recesses therein dimensioned to receive therewithin the full height of said articles; and

e. moving said pressure platen and bed platen relative to each other and said supported heated film while said film is of substantially linear configuration to bring said lower surface of said pressure platen about said apertures therein adjacent the surface of said substrate about each of said plurality of aritcles and to deform said heated thermoplastic film from said substantially linear configuration into sheaths about each of said articles and to press said film against said substrate outwardly of the periphery of each of said articles and thereby effect bonding thereof to said substrate about each of said articles.

4,219,988

AUTOMATIC HIGH-SPEED WRAPPING MACHINE

Frank G. Shanklin, Groton, Mass., and Francis X. King, Jr., Nashua, N.H., assignors to Shanklin Corporation, Ayer, Mass.

Filed Oct. 11, 1977, Ser. No. 840,645

Int. Cl.² B65B *9/06, 51/26*

U.S. Cl. 53—550 **21 Claims**

5. An automatic film wrapping machine for wrapping products in heat sealable thermoplastic film in which the flow of products through the machine is substantially continuous and in a straight line comprising:

an infeed conveyor for feeding said product into said machine at a continuous velocity and spacing,

a film inverter comprising:

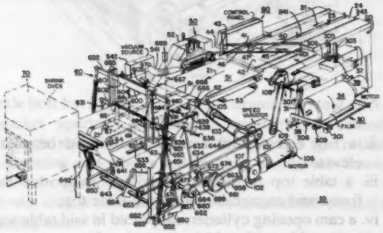
a fixed bed,

an inverting head extending in a direction which is substantially an angle of 45° with respect to the longitudinal direction of travel of said product through the machine,

means for movably supporting and releasably securing said inverting head on said fixed bed to allow movement of said support means and said inverting head as a unit along said 45° angular direction in the direction of the extension of the inverting head to allow the end of said inverting head to be positioned and secured near one edge of the product provided by said infeed conveyor to adjust for different product widths,

a film supply providing folded plastic film to said inverter with the fold in said film at said end of said inverting head,

a side sealer,



said product being inserted into said inverter by said infeed conveyor and surrounded by said film by said inverter while continuing to travel at a continuous flow, said inverter providing said surrounded products to said side sealer, with the free edges of said film at one side of said surrounded product,

said side sealer adapted to receive said film covered products from said inverter and to seal said free edges while said product is running at a continuous velocity to form a tube of film containing said products with substantially uniform spacing,

an end sealer,

said side sealer providing said film covered products to said end sealer,

said end sealer providing a seal transverse to said tube of uniformly spaced products while said products are travelling through said end sealer at a substantially continuous velocity, said end sealer severing the film tube between adjacent products to provide individually sealed packages as the output of said end sealer.

4,219,989

BAGGING APPARATUS

H. David Andrews, College Park, Ga., assignor to Star Packaging Corporation, College Park, Ga.

Filed Jul. 26, 1979, Ser. No. 60,939

Int. Cl.³ B65B *43/34*

U.S. Cl. 53—572 **7 Claims**

1. A stretch bagging apparatus comprising:

A. A table support for an article being packaged within a stretch bag, including an upright frame and a table top longitudinally reciprocable upon said frame;

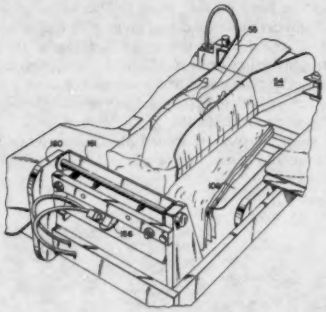
B. A stretch bag elevator, affixed at a bagging end of said frame so as to support a plurality of open ended stretch bags in superposed relationship with a top open ended bag aligned with said longitudinally reciprocable table top;

C. A pair of transversely reciprocable bag opening horns affixed to said longitudinally reciprocable top in axial

alignment with said bag elevator and including a cam mechanism being first actuated to open transversely said horns so as to stretch the bag during the bagging mode, as said horn ends axially advance into the top bag, and said cam mechanism being second actuated to close transversely said horns sequentially of bagging as said horns and table top are reciprocated away from said bag elevator;

D. A pressurized air actuation system including:

i. a source of pressurized air;



ii. a bag elevator lift cylinder positioned beneath said elevator;

iii. a table top reciprocating cylinder supported in said frame and engageable with said table top;

iv. a cam opening cylinder, supported in said table top and engageable with said bag opening horns cam mechanism, and

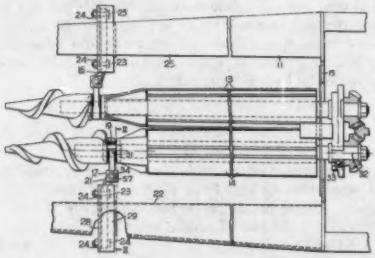
v. a bag opening jet tube with its open end supported adjacent one or more of said bag opening horns, such that pressurized air is diverted into said open ended bag during the bag opening operation.

4,219,990

BEARING MOUNT FOR A CORN HARVESTER SNAPPING ROLL

Donald J. Hill, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed May 1, 1979, Ser. No. 34,918
Int. Cl.[3] A01D *45/02*
U.S. Cl. 56—14.2 **4 Claims**



1. In a corn harvester having fore and aft extending snapping rolls each having its front and rear ends rotatably supported on the frame of the harvester by front and rear bearings, a mount for supporting the front bearing characterized by

first and second parts in general lateral end-to-end alignment with adjacent ends thereof presenting mating cylindrical surfaces defining a cylinder whose axis extends in a lateral direction permitting said parts to be pivotally adjusted relative to one another about said axis to permit alignment of the axes of said front and rear bearings in a generally horizontal plane,

first releasable fastening means securing said adjacent ends of said parts to one another whereby said parts are releasably retained in fixed position relative to one another

the bearing at the front of one of said snapping rolls being supported by one of said parts, and

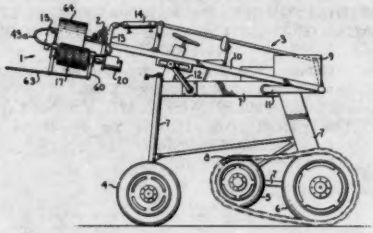
second releasable fastening means rigidly securing said other part to said frame.

4,219,991

TASSEL PULLER

Thomas B. Bray, Rte. 1, Wapella, Ill. 61777

Filed Mar. 29, 1978, Ser. No. 891,447
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—63 **25 Claims**



1. A corn detasseling head comprising:

(a) a roller frame;

(b) first and second sets of cylindrical segments aligned end-to-end to form first and second axially rotatable rollers, respectively, that are mounted on said frame in parallel contacting relationship, said cylindrical segments being inflatable rubber tires having resilient circumferential tread surfaces, the tread surfaces of the rubber tires of one of said sets being abutted and biased against those of the other set whereby the tires of both sets are compressed to effect flattening of their treads and formation of a detasseling nip that leads to tassel gripping surfaces of increased area as a result of flattening the tires, and

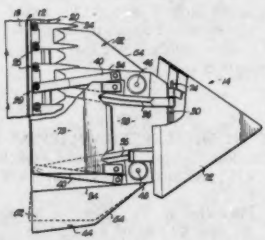
(c) means for simultaneously rotating the rubber tires of both of said rollers.

4,219,992

ROW CROP ATTACHMENT FOR COMBINES

Albert R. Henry, Sr., Salina, Kans., assignor to Darf Corporation, Edenton, N.C.

Filed Aug. 9, 1978, Ser. No. 932,207
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—119 **26 Claims**



1. A row attachment assembly for a harvester of the type having a forwardly disposed cutter bar extending transversely

at the harvester and cutter means supported on the bar for severing standing crops at the stalk beneath the fruit, said attachment including:

a pair of crop-receiving divider pans adapted to be mounted on said cutter bar and project forwardly therefrom in laterally spaced relation to one another for defining a stalk-receiving throat therebetween extending generally fore-and-aft of the harvester; and

means for variably constricting said throat to the minimum width dimension required to permit passage of said stalks through the throat,

said constricting means including a pair of opposed crop-catching wings each pivotally mounted on a respective one of said pans for cooperable shifting movement opening and closing said throat, and

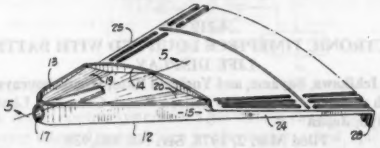
means yieldably biasing said wings toward a position closing the throat whereby the wings are tightly held against said stalk as the latter pass through the throat such that fruit dislodged from the stalks by the harvester is caught by the underlying wings.

4,219,993

LAWN RAKES

Pete Cosmos, Massillon, Ohio, assignor to True Temper Corporation, Cleveland, Ohio

Filed Jul. 19, 1976, Ser. No. 706,778
Int. Cl.³ A01D *7/00*
U.S. Cl. 56—400.17 **8 Claims**



1. A molded plastic rake head comprising

a body member of sheet-like form lying generally in a plane and having two substantially straight side edges, one end of each of which terminates at a handle socket having a rake handle receiving opening and the other ends of which are joined by a front edge, there being a wall extending around said edges and attached to said edges substantially perpendicular to said general plane,

said body member containing said elongated handle socket integral with and extending in said plane from said socket opening toward said front edge, a plane through the axis of said socket and substantially perpendicular to said general plane substantially bisecting the angle formed by said side edges,

said body member having at least one undulation on each side of said socket, the crest of at least one such undulation on each side of said socket extending from each of said side walls in spaced relation to said socket opening to the wall on said forward edge without crossing the center line of said socket,

there being a plurality of raking prongs projecting forwardly from said opening out from the wall on said front edge.

4,219,994

ADJUSTABLE PIVOTING HAND RAKE

Julian J. Ciscon, 5758 W. 59th St., Chicago, Ill. 606038

Filed Mar. 8, 1979, Ser. No. 18,611
Int. Cl.³ A01D *7/00*
U.S. Cl. 56—400.14 **3 Claims**

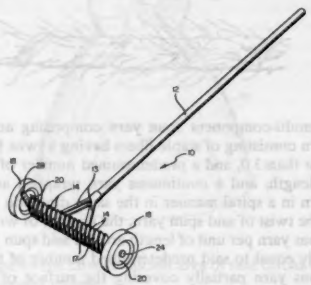
1. An adjustable height, pull-type ground rake comprising:

a rake assembly including a plurality of rake tynes rigidly mounted along a shaft, and a handle for pulling said rake assembly;

an elongated bracket, at each end of said rake shaft, having a series of apertures extending along the length of said bracket;

means mounting one end of each of said brackets to a respective end of said rake shaft;

a pair of ground engaging wheels including a hub having a central axis positionably aligned with a selected one of said bracket apertures corresponding to the desired height of said rake tynes and thus pre-setting the maximum ground penetration of said tynes;



an axle bolt having one end rigidly mounted to said selected bracket aperture and having another end extending through said hub along said central axis for rotatably supporting said wheels and enabling pivotal movement of said rake tynes; and

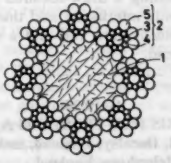
said rake shaft is pivotally moved below said hub central axis during use.

4,219,995

WIRE ROPE

Shinobu Tajima, and Kazutoshi Ohta, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1978, Ser. No. 940,242
Claims priority, application Japan, Sep. 7, 1977, 52/107551
Int. Cl.³ D07B *1/06*
U.S. Cl. 57—220 **8 Claims**



1. A wire rope formed by twisting a first type of metal wire together with a second type of metal wire, said wire rope being of the Seal type of construction comprising a fiber center core and a plurality of strands wrapped about said core, each said strand having a center wire, an inner layer of wires and an outer layer of wires with at least one of said wires being of said first type and the other wires adjacent to said first type wire being of said second type, said wire rope further comprising a further strand inserted into said fiber center core to form a central strand, wherein said central strand is of the same type as said strands laid around said core, the loss factor of said first type of metal varying from the loss factor of said second type of metal by at least 50% whereby said wire rope damps vibrations that are induced therein.

4,219,996

MULTI-COMPONENT SPUN YARN

Hiroshi Edgawa; Toshinori Fujita, both of Ohtsu, and Yasuo Uesugi, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 18, 1978, Ser. No. 934,806
Claims priority, application Japan, Aug. 23, 1977, 52-100969; Aug. 23, 1977, 52-100970; Aug. 23, 1977, 52-100973
Int. Cl.[2] D02G *3/04, 3/26, 3/34*
U.S. Cl. 57—225 13 Claims

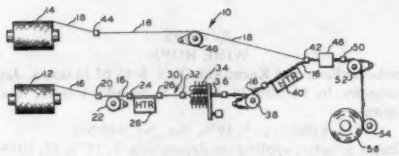
1. A multi-component spun yarn comprising an open-end spun yarn consisting of staple fibers having a twist factor K of not more than 3.0, and a predetermined number of twists per unit of length, and a continuous yarn wrapped around said spun yarn in a spiral manner in the same direction of twist as that of the twist of said spun yarn, the number of wraps of said continuous yarn per unit of length around said spun yarn being essentially equal to said predetermined number of twists, said continuous yarn partially covering the surface of said spun yarn.

4,219,997

SPUN-LIKE CONTINUOUS MULTIFILAMENT YARN

Charles S. Hatcher, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 17, 1978, Ser. No. 934,666
Int. Cl.[2] D02G *1/20, 1/20*
U.S. Cl. 57—245 22 Claims



1. A process for producing a final continuous multifilament yarn comprising heating a draw-textured first multifilament yarn end and mutually interlacing said thus heated draw-textured first multifilament yarn end and a drawn flat second multifilament yarn end.

4,219,998

APPARATUS FOR TWISTING A STRAND

William M. Farnhill, Burnley, England, assignor to Platt Saco Lowell Limited, Helmshore, England

Filed Sep. 20, 1978, Ser. No. 944,099
Claims priority, application United Kingdom, Sep. 21, 1977, 39245/77
Int. Cl.[3] D02G *3/26, 3/28;* D01H *5/28;* D02G *1/04*
U.S. Cl. 57—293 16 Claims

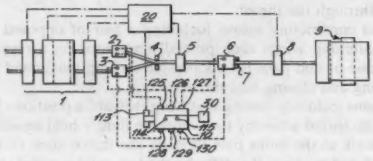
1. Apparatus for twisting a strand such that it has repeated along its length alternating zones of opposite twist, said apparatus comprising

a vortex device formed with a pair of fluid inlets for alternately directly fluid into said device to produce within said device vortices in opposite directions for twisting said strand passing therethrough and having a body portion formed with a bore through which said strand in use is arranged to pass, said bore being formed with a first portion of one cross-sectional area and a second portion of another and smaller cross-sectional area which latter is of the order of twice the cross-sectional area of said strand in use arranged to pass therethrough,

a valve for controlling a supply of said fluid to said fluid inlets, said valve comprising

a valve body being formed with first and second fluid channels communicating with respective ones of said pair of fluid inlets, and

a rotatable valve member mounted so that a surface thereof rotates relative to a cooperating surface of said



valve body, said cooperating surface of said valve member being formed with a plurality of channels whereby fluid may be supplied alternately to said first and second channels of said valve body,

means for supplying said fluid under pressure to said rotatable valve member, and

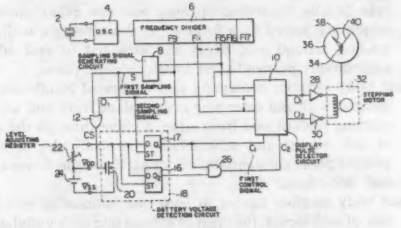
plastics sealing means at the points of contact between said cooperating surfaces for preventing improper travel of fluid along said surfaces.

4,219,999

ELECTRONIC TIMEPIECE EQUIPPED WITH BATTERY LIFE DISPLAY

Singo Ichikawa, Sayama, and Yoshiaki Kato, Higashimurayama, both of Japan, assignors to Citizen Watch Company, Limited, Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,939
Claims priority, application Japan, Mar. 3, 1977, 52-22202; Jul. 26, 1977, 52-89671
Int. Cl.[2] G04C *3/00;* G04B *37/12*
U.S. Cl. 368—66 21 Claims



1. An electronic timepiece powered by a battery, comprising:

a frequency standard providing a relatively high frequency signal;

frequency converter means responsive to said relatively high frequency signal for providing first sampling signal and a standard time signal, each signal comprising a train of pulses and mutually differing in phase;

drive circuit means responsive to said standard time signal for producing a drive signal;

time indicating hands for displaying current time;

a motor responsive to said drive signal for advancing said time indicating hands in a normal mode of advancement;

a battery voltage detection circuit responsive to said first sampling signal for detecting when the voltage of said battery falls below a first predetermined level before said motor is driven and for producing a first control signal indicative thereof, and further responsive to said standard

time signal for detecting a drop in voltage of said battery below a second predetermined level while said motor is being driven, and for producing a second control signal indicative thereof; and

indication means responsive to said first and second control signals for selectively indicating that said battery voltage has fallen below said first and second predetermined levels.

4,220,000

FUEL CONTROL SYSTEM FOR A GAS TURBINE ENGINE

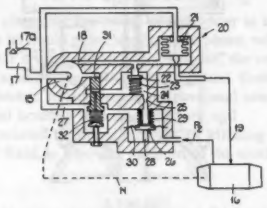
Geoffrey A. Lewis, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Apr. 14, 1978, Ser. No. 896,445

Claims priority, application United Kingdom, Jun. 18, 1977, 25581/77

Int. Cl.³ F02C *9/38*

U.S. Cl. 60—39.28 R **2 Claims**



1. A fuel control system for a gas turbine engine, comprising a pump adapted to be driven by the engine, a first, spill valve for spilling fuel from the outlet of said pump, a second valve in series with said first valve between the pump outlet and a low pressure zone, said second valve being responsive to an increase in the delivery pressure of a compressor of the engine to reduce spill flow, and a third valve in parallel with said second valve, said third valve being responsive to an increase in said compressor delivery pressure to increase spill flow.

4,220,001

DUAL EXPANDER ROCKET ENGINE

Rudi Beichel, Sacramento, Calif., assignor to Aerojet-General Corporation, LaJolla, Calif.

Filed Aug. 17, 1977, Ser. No. 825,411

Int. Cl.² F02K *9/06, 9/02;* B64C *15/04*

U.S. Cl. 60—225 **4 Claims**

1. A composite rocket engine comprising:

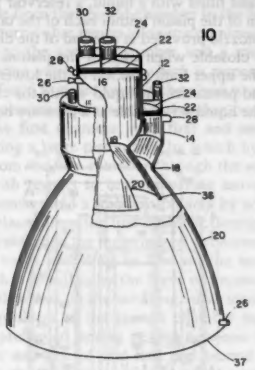
a first engine having a combustion chamber, throat section, and expansion nozzle; and

a second engine, also having a combustion chamber, throat section, and expansion nozzle positioned such that at least a portion of said second engine is disposed within said first engine, wherein:

said second engine traverses the throat section of said first engine so that the throat sections of the two engines function in parallel when said first and second engines operate together;

the expansion nozzle of said second engine terminates within the expansion nozzle of said first engine proximate the throat section of said first engine to minimize weight of the composite engine; and

the expansion nozzle of said first engine is shaped to complete expansion of gases from said second engine and provide said second engine with an effective area ratio when operated alone equal to the maximum cross-sectional area of said expansion nozzle of said first engine



divided by the cross-sectional area of said throat section of said second engine.

4,220,002

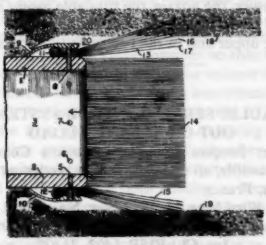
JET ENGINE WITH NOISE ENERGY DISSIPATION

Roland J. Colton, 41 Vista Way, Port Washington, N.Y. 11050

Filed Dec. 23, 1977, Ser. No. 863,836

Int. Cl.² F02K *1/00;* B63H *11/10;* F01N *3/00*

U.S. Cl. 60—271 **6 Claims**



1. Apparatus for reducing noise in jet engines having a tailpipe comprising in combination with said tailpipe a plurality of metallic wires mounted on said tailpipe, said wires being located about the periphery of said tailpipe and extending downstream of the terminus of said tailpipe in the direction of the flow of exhaust gas therefrom, and airfoil means mounted adjacent said tailpipe terminus for deflecting the airstream in the region of said tailpipe terminus and creating a low pressure region in the vicinity of the exhaust gases, said wires serving to dampen the vibrations of said exhaust gases in said low pressure region.

4,220,003

APPARATUS FOR GENERATING ROTATIONAL POWER

Kiyoshi Doi, No. 1341-23, Aoyama Aza-Minamiyama, Himeji-shi, Hyogo-ken, Japan

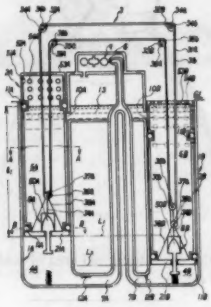
Filed Mar. 30, 1979, Ser. No. 25,611

Int. Cl.² F03G *3/00*

U.S. Cl. 60—325 **8 Claims**

1. An apparatus for generating rotational power comprising a pair of tanks, a pair of pistons provided in the tanks respectively and reciprocally slidingly movable between an upper limit position and a lower limit position alternately upward and downward, coupling means interconnecting the pair of pistons

in balance for causing one of the pistons to move downward or upward while permitting the other piston to move upward or downward, a closed chamber formed under the piston in each of the tanks and filled with a liquid, a reservoir provided in an upper portion of the piston within each of the tanks for storing the liquid, a nozzle provided at one end of the closed chamber, valve means closable when each of the pistons moves downward from the upper limit position to the lower limit position to confine and pressurize the liquid within the closed chamber and render the liquid serviceable as a pressure liquid, the valve



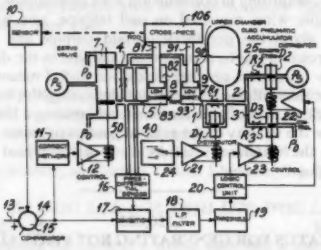
means being openable when each of the pistons moves upward from the lower limit position to the upper limit position to pass the liquid in the reservoir into the closed chamber, means rotatable by a jet of the pressure liquid discharged from the nozzle to generate rotational power, and a liquid feed channel for returning the discharged liquid to the reservoir after the liquid has rotated the rotatable means for the generation of rotational power, the nozzle, the rotatable means and the liquid feed channel being positioned substantially at the same level as or above the upper end of the reservoir to circulate the liquid.

4,220,004

HYDRAULIC SERVO-CONTROL SYSTEM WITH OUT-OF-BALANCE LOAD

Jean Abeille; Jacques Coeuillet; Francois Coutenceau, and Claude Grandfils, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 22, 1979, Ser. No. 41,412
Claims priority, application France, May 26, 1978, 78 15795
Int. Cl.[3] F15B *1/02, 21/08*
U.S. Cl. 60—413 **11 Claims**



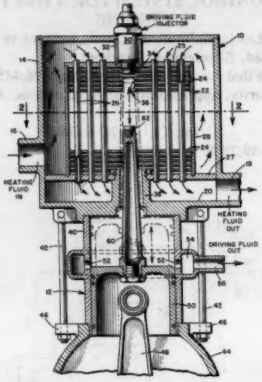
1. In a electro-hydraulic servo-control system whose load is unbalanced by a varying amount comprising at least two half double acting single-rod rams, and a pneumatic accumulator for compensating for the unbalance, the improvements comprising control servo-valve sensing means for measuring the pressure resulting from said unbalance, controlling and damping electrical and hydraulic circuit means, all said means being arranged so as to form a main loop for controlling the position of the load and an auxiliary loop for so regulating the pressure in said pneumatic accumulator that the unbalance is compensated for in said main loop.

4,220,005

COMBINATION VAPORIZED DRIVING FLUID GENERATOR AND ENGINE UNIT

Edmund A. Cutts, Box 8, Oxford, Md. 21654

Continuation of Ser. No. 689,045, May 24, 1976, abandoned.
This application Jan. 25, 1978, Ser. No. 872,037
Int. Cl.[2] F01K *11/00*
U.S. Cl. 60—514 **14 Claims**



1. A vaporized driving fluid generator and engine unit comprising:

a generator housing for conducting heating fluid past heat conductive elements within the housing, said elements being exposed to said heating fluid within said housing and being carried by a casing to transmit heat from said heating fluid to a driving fluid injected into said casing, said housing surrounding said casing to conduct heating fluid over the exterior of said casing and then through said heat conductive elements,

means exposed to ambient air temperature for intermittently injecting successive predetermined quantities of driving fluid into said casing to be vaporized by heat accumulated in said elements,

a cyclically operable expansible chamber engine having a reciprocable piston disposed therein and exposed to ambient air temperature in open communication with said casing to receive vaporized driving fluid from said casing and by expansion of said driving fluid within said engine produce operation of said engine means extending directly from said piston and movable thereby to restrict flow through the said open communication, and

means controlling said driving fluid injecting means to inject said driving fluid quantities synchronized with the cyclic operation of said expansible chamber engine.

4,220,006

POWER GENERATOR

Robert J. Kindt, 100 Eastgate Dr., Rochester, N.Y. 14617

Filed Nov. 20, 1978, Ser. No. 961,942
Int. Cl.[3] F03G *7/06*
U.S. Cl. 60—527 **10 Claims**

1. Apparatus utilizing the volumetric expansion of water upon its change of phase for generating power, said apparatus comprising:

a chamber having heat transmitting, fluid impervious, flexible walls, said chamber being filled with water;

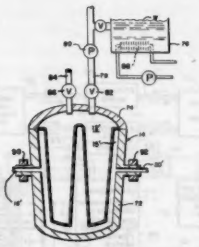
a housing having an internal cavity in which said chamber is

located, said housing having pressure-containing walls spaced from said flexible walls of said chamber;

a fluid filling such space between said pressure-containing walls and said flexible walls;

means for circulating said fluid through said internal cavity in such space;

a conduit connected to said housing in fluid communication with said interior cavity;



means for changing the phase of the water in said chamber between its liquid phase and its solid phase, whereby when said water is changed to its solid phase, the volume of said water expands thereby expanding said flexible walls of said chamber to displace a proportional amount of fluid from said housing into said conduit; and

means associated with said conduit for utilizing said displace moving fluid as a power medium to do work.

4,220,007

SERVO-ASSISTED HYDRAULIC MASTER CYLINDER

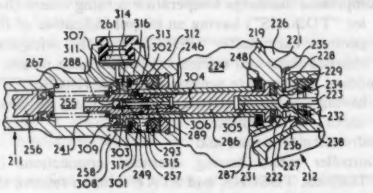
Alastair J. Young, Leamington Spa, England, assignor to Automotive Products Limited, Leamington Spa, England

Division of Ser. No. 797,769, May 17, 1977, Pat. No. 4,172,364. This application Feb. 2, 1979, Ser. No. 9,084

Claims priority, application United Kingdom, May 19, 1976, 20569/76; Mar. 19, 1977, 11753/77

Int. Cl.[2] B60T *13/20*

U.S. Cl. 60—550 **2 Claims**



1. A servo-assisted hydraulic master cylinder for a vehicle braking system comprising a movable wall having a servo valve housing operatively connected thereto, a driver-controlled servo valve member in the servo valve housing for controlling a source of relatively high pressure and a source of relatively low pressure to vary a fluid pressure differential across the movable wall, a first piston in the master cylinder adapted to be moved by the servo valve member, a second piston in the master cylinder adapted to be moved by the servo valve housing, a first port in the master cylinder for connection to a tank of hydraulic fluid, a second port in the master cylinder for connection to a vehicle brake actuator, a first chamber in the master cylinder connected to said first and second ports, movement of the servo valve member in a brake-applying direction shutting off communication from the first chamber to the first port and causing the first piston to reduce the volume of the first chamber to create a brake-applying pressure at the second port, a second chamber in the master cylinder connected to the first port, movement of the second piston in the brake-applying direction shutting off communication from the second chamber to the first port and increasing the volume of the second chamber, first non-return valve means allowing communication from the second chamber to the first chamber, second non-return valve means allowing communication from the first port to the second chamber and a metering valve having a metering valve member which is responsive to pressure in each of said first and second chambers to progressively increase the pressure in the second chamber over a range of pressure in the first chamber, said first and second pistons together defining a large piston area by which hydraulic fluid is displaced from the first chamber through the second port at a high rate with respect to brake-applying movement of the servo valve member and a small piston area by which hydraulic fluid is displaced from the first chamber through the second port at a low rate when the metering valve becomes operative, the metering valve including an area on the metering valve member which is acted on by the force of pressure in the first chamber, another area on the metering valve member which is acted on by pressure in the second chamber to reduce said force and a preloaded spring acting between the metering valve member and one of said first and second pistons, said force moving the metering valve member against the preloaded spring to open the metering valve and increase the pressure in the second chamber and the resultant increase in the pressure in the second chamber reducing said force to allow the preloaded spring to close the metering valve, the master cylinder also comprising an operative connection between the servo valve member and the first piston providing a force reaction of pressure in the first chamber onto the servo valve member such that the effort required by the driver increases in direct proportion to the pressure in the first chamber and abutment means establishing a direct mechanical connection between the servo valve member and the servo valve housing in the event of a failure to maintain the source pressures to move both the first piston and the secnd piston in the brake-applying direction, the abutment means allowing normal operation of the metering valve member so that the metering valve continues to function normally, the volume of the second chamber increases with brake-applying movement of the servo valve housing, the second piston also acting to decrease the volume of the first chamber and the metering valve being arranged so that pressure in the first chamber acts on the metering valve member in opposition to pressure in the second chamber and resilient means both tending to keep the control valve seated, the arrangement being such that pressure in the second chamber remains at tank pressure by communication through the second non-return valve means up to a point when the metering valve becomes operative to allow controlled communication from the first chamber to the second chamber whereupon the pressure in the second chamber increases with increasing pressure in the first chamber and at a higher rate until becoming equal to the pressure in the first chamber.

4,220,008

EXHAUST BRAKE MODULATING CONTROL SYSTEM

Dennis A. Wilber, Elizabethtown, and John P. Schnapp, Columbus, both of Ind., assignors to Cummins Engine Company, Columbus, Ind.

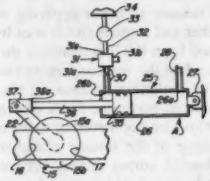
Filed Dec. 28, 1978, Ser. No. 973,739

Int. Cl.[3] F02B *37/00*

U.S. Cl. 60—602 **9 Claims**

1. A rotary exhaust brake modulating control system for use on an internal combustion engine having an exhaust manifold, a turbocharger with a housing having a chamber in which a turbine wheel is rotatably mounted, and a source of pressurized fluid; said system comprising a double-acting piston-cylinder assembly having one end of a cylinder adapted to communicate with the exhaust manifold and a second end of the cylinder separated from the said one end by a piston head; an adjustable control valve having an outlet communicating with the cylinder second end and a plurality of inlets selectively connected to the outlet, one of said inlets being adapted to be in communi-

cation with the source of pressurized fluid and a second inlet being vented to the atmosphere; a hollow section having an inlet adapted to be connected to the exhaust manifold and an outlet adapted to be connected to the turbine wheel chamber; a rotor mounted within said hollow section for rotation between a first selected position wherein substantially unrestricted gas flow occurs between said housing section inlet and outlet and a second selected position wherein gas flow between said inlet and outlet is substantially blocked by said rotor; means operatively connected to said piston head and said rotor



wherein rotational movement of said rotor is responsive to the relative movement of said piston head within said cylinder; and pressure regulating means disposed intermediate the source of pressurized fluid and the control valve one inlet and being preset whereby the pressure of the pressurized fluid entering the control valve one inlet balances a predetermined exhaust manifold pressure exerted on one side of said piston head causing the latter to assume a relative position within said cylinder and the rotor to assume a position generating a predetermined exhaust braking effect.

4,220,009

POWER STATION

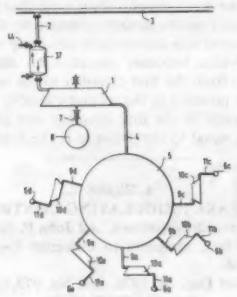
Joachim O. M. Wenzel, Hauptmannsreute 46, 7 Stuttgart 1, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,982

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702232; Feb. 17, 1977, 2706702; Mar. 2, 1977, 2709036; Jun. 24, 1977, 2728418

Int. Cl.[2] **F01K** *25/00, 27/00*

U.S. Cl. 60—648 **15 Claims**



1. A power plant comprising:

(i) a pressure medium conveying main pipe

(ii) a branch pipe connected to said main pipe

(iii) an energy conversion device connected to receive pressure medium from said branch pipe and operable to convert pressure energy of said medium into usable energy, and

(iv) an intermediate buffer reservoir connected to receive pressure medium from said conversion device and adapted to supply said pressure medium from said reservoir to a pressure medium consuming load.

4,220,010

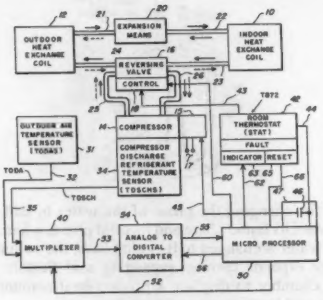
LOSS OF REFRIGERANT AND/OR HIGH DISCHARGE TEMPERATURE PROTECTION FOR HEAT PUMPS

Dale A. Mueller, St. Paul, and Stephen L. Serber, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 7, 1978, Ser. No. 967,341

Int. Cl.[2] **F25B** *49/00, 41/00;* **F04B** *49/10*

U.S. Cl. 62—126 **3 Claims**



1. A loss of refrigerant and/or high discharge temperature detection and control system (hereinafter "control system") for a reverse cycle refrigeration system (hereinafter "system") for heating and cooling a building wherein said system comprises refrigerant compression means, refrigerant compression control means, an indoor coil, an outdoor coil, and refrigerant conduit means connecting said compression means and said coils, said control system comprising:

outdoor air temperature sensing means (hereinafter "TODAS") having an output indicative of outdoor air temperature (hereinafter "TODA");

compressor discharge temperature sensing means (hereinafter "TDSCHS") having an output indicative of the temperature (hereinafter "TDSCH") of the refrigerant discharged from said refrigerant compression means; and

building temperature sensing means (hereinafter "STAT") having an output indicative of a demand for heating or cooling of the building;

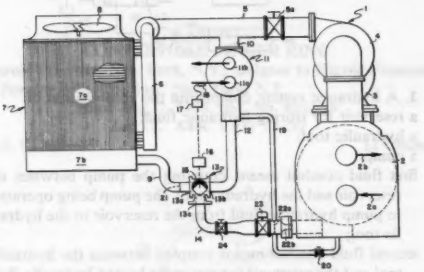
fault indicator means; and

controller means having operative connections to said TODAS, TDSCHS, and STAT so as to receive the outputs thereof, said controller means including circuit connect-disconnect means selectively interconnecting said STAT output to said refrigeratant compression control means whereby, when said STAT output is connected thereto, said compression means is enabled to operate and, when said STAT output is disconnected therefrom, said compression means is inhibited from operating, said controller means being connected to said fault indicator and including (i) means responsive to the magntides of TDSCH and TODA and effective to actuate said fault indicator whenever TDSCH is at or above a predetermined value (hereinafter "TMAX"), TMAX being a function of the magnitude of TODA, and (ii) means responsive to the magnitude of TDSCH and effective whenever TDSCH is at or above a predetermined value (hereinafter "TDMG") both to actuate said fault indicator and to disconnect said STAT output from said refrigerant compression control means to thereby inhibit said compression means from operating.

4,220,011
AIR COOLED CENTRIFUGAL REFRIGERATION SYSTEM WITH WATER HEAT RECOVERY

Mark O. Bergman, La Crosse; John W. Leary, Onalaska; Dunne F. Sanborn, and Chester D. Ware, both of La Crosse, all of Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 22, 1978, Ser. No. 972,309
Int. Cl.[3] F25B 27/02
U.S. Cl. 62—185 8 Claims



1. A refrigeration system for producing a chilled liquid and selectively operable to produce a heated liquid, said system comprising

a. evaporator means for vaporizing a condensed refrigerant by heat exchange with a source of liquid, whereby a chilled liquid is produced;

b. centrifugal compressor means connected to said evaporator means for receiving vaporized refrigerant and compressing same;

c. air cooled condenser means connected to said centrifugal compressor means for receiving compressed refrigerant and condensing same by heat exchange with a source of air;

d. liquid cooled condenser means connected to said centrifugal compressor means in parallel flow relationship with said air cooled condenser means for receiving compressed refrigerant and condensing same by heat exchange with a source of liquid, whereby a heated liquid is produced;

e. a first conduit connected to an outlet of said air cooled condenser means;

f. a second conduit connected to an outlet of said liquid cooled condenser means;

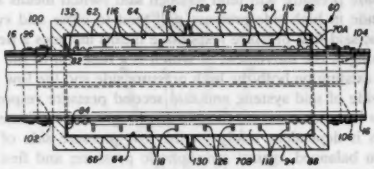
g. valve means connected to said first and second conduits for selectively varying the flow of condensed refrigerant from each of said condenser means, whereby the flow of condensed refrigerant from said air cooled condenser means may be reduced so as to cause at least partial flooding thereof and thereby reduce its capacity, while the flow of condensed refrigerant from said liquid cooled condenser means may be increased so as to increase the production of heated liquid; and

h. third conduit means connecting said valve means to said evaporator means.

4,220,012
APPARATUS FOR FREEZING A SLUG OF LIQUID IN A SECTION OF A LARGE DIAMETER FLUID TRANSMISSION LINE

Beryle D. Brister, P.O. Box 2329, Amarillo, Tex. 79105

Continuation-in-part of Ser. No. 722,665, Sep. 13, 1976, Pat. No. 4,112,706. This application Feb. 16, 1978, Ser. No. 878,254
The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.
Int. Cl.[2] F25B 41/04; G01K 13/00; G01M 3/02
U.S. Cl. 62—130 14 Claims



1. Apparatus for freezing a slug of liquid in a section of fluid transmission line comprising, in combination:

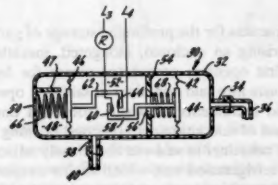
a detachable housing having side portions for enclosing a section of the transmission line and end portions for engaging in sealing relation with opposite ends of the transmission line section, the side and end portions defining a cooling chamber when assembled around the transmission line, the cooling chamber being operable when filled by discharging cryogenic cooling fluid from spaced fluid distribution means, to confine a volume of said cryogenic cooling fluid in its liquid phase in intimate contact with the exterior surface of the section of transmission line enclosed by the housing, said detachable housing including inlet port means for admitting said cryogenic cooling fluid into the cooling chamber and exhaust port means for discharging said cryogenic cooling fluid out of the cooling chamber; and,

said fluid distribution means including header means radially spaced from the transmission line and connected in fluid communication with the inlet port means for discharging said cryogenic cooling fluid into the cooling chamber and onto the enclosed surface of the transmission line.

4,220,013
PRESSURE COMPENSATED CONTROL FOR AIR CONDITIONING SYSTEM OR HEAT PUMP

James R. Harnish, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,637
Int. Cl.[3] F25B 41/00, 1/00; F04B 49/00
U.S. Cl. 62—209 2 Claims



1. A vapor compression cycle refrigeration system comprising: a compressor having a discharge outlet and a suction inlet; a condenser; an expansion device; and an evaporator, all connected in closed circuit relation such that the high pressure side of the system is between the compressor discharge outlet and the expansion device and the low pressure side of the system is between said expansion device and said compression suction inlet; an electric motor driving said compressor; and cutout

means for discontinuing the power supplied to said electric motor including first pressure responsive means responsive to pressure both on the high pressure and low pressure sides of said system and second pressure responsive means responsive to pressure on the low pressure side of said system and a relatively fixed reference pressure, said cutout means further including first resilient means for biasing said first pressure responsive means and second resilient means for biasing said second pressure responsive means, and switch means operated in response to said first and second pressure responsive means and said first and second resilient means such that a decrease in low side pressure will tend to open said switch means and a decrease in high side pressure will tend to close said switch means, said first pressure responsive means includes a flexible diaphragm, the movement of which is a function of the pressures existing on both the high pressure side and the low pressure side of said system; and said second pressure responsive means includes a second flexible diaphragm, the movement of which is dependent solely on the low pressure side of said system balanced against atmospheric pressure; and first and second electrical contacts operatively connected to said first and second diaphragms respectively.

4,220,014

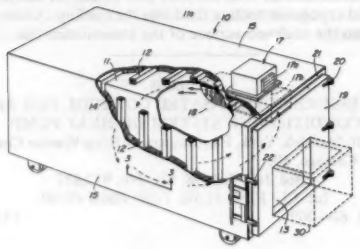
APPARATUS FOR PROLONGED STORAGE OF GARBAGE

William P. Connors, 12 Wakefield St., Reading, Mass. 01867

Continuation of Ser. No. 843,021, Oct. 17, 1977, abandoned, which is a division of Ser. No. 697,220, Jun. 17, 1976, abandoned. This application Oct. 20, 1978, Ser. No. 953,200

Int. Cl.[3] B60H *3/04*

U.S. Cl. 62—239 **5 Claims**



1. An apparatus for the prolonged storage of garbage and the like, comprising an enclosed, elongated, insulated container having a first opening; compactor means for feeding increments of waste into said container at said first opening and for moving said increments of waste from said one end to an opposing end of said container; a second opening through the roof of said container at said one end closely adjacent said first opening; a refrigeration unit which has its evaporator section extending through said second opening into the container, said refrigeration unit being adapted to cool said waste increments without freezing thereof; means including a perforated baffle being provided to surround said evaporator section for providing a longitudinal air flow at said roof away from said one end in the direction of movement of said waste increments; the compressor section of said refrigeration unit being exterior to said container; the top of said first opening being below the bottom of said evaporator.

4,220,015

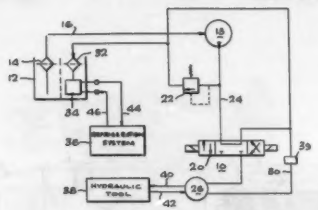
HYDRAULIC FLUID COOLING SYSTEM

P. G. Johansing, Jr., 14069 Bayside Dr., Norwalk, Calif. 90650

Continuation of Ser. No. 824,418, Aug. 15, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,873

Int. Cl.[2] F25D *15/00, 23/12*

U.S. Cl. 62—331 **9 Claims**



1. A hydraulic system comprising the combination of:

a reservoir for storing hydraulic fluid;

a hydraulic tool;

a pump;

first fluid conduit means coupling the pump between the reservoir and the hydraulic tool, the pump being operative to pump hydraulic fluid from the reservoir to the hydraulic tool;

second fluid conduit means coupled between the hydraulic tool and the reservoir for returning heated hydraulic fluid from the hydraulic tool to the reservoir; and

a refrigeration system having means for compressing and condensing a refrigerant and means disposed at least partly within the reservoir and coupled to receive the compressed and condensed refrigerant for providing heat exchange between the refrigerant and the hydraulic fluid to cool the heated hydraulic fluid returned from the hydraulic tool.

4,220,016

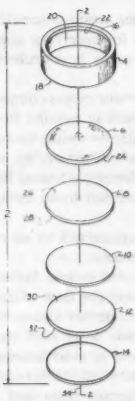
SKIN JEWELRY

Rita K. Frenger, 5409 Old Dover Blvd., Fort Wayne, Ind.

Filed Feb. 27, 1976, Ser. No. 662,123

Int. Cl.[2] A44C *17/00*

U.S. Cl. 63—2 **6 Claims**



1. Decorative jewelry which can be worn on the skin of the wearer comprising a rigid decorative portion having a decorative front side and a non-decorative back side, a sheet of resil-

ient and flexible material, said sheet having a resiliency and flexibility generally the same as the human skin, said sheet having an exposed surface facing away from said decorative portion, means for attaching said sheet to the back side of said decorative portion, a layer of adhesive on said exposed surface of said sheet, said decorative portion and sheet having edges extending generally perpendicularly from portions of said front and back sides and said exposed surface, said means comprising a rigid retainer covering said edges and a portion of said decorative front side, a back plate secured to said retainer, said decorative portion being snugged between said retainer and said back plate, means for securing said sheet to said back plate, at least a portion of said sheet and said adhesive layer being outside of said retainer.

4,220,017

CONVERTIBLE FINGER RING

Harold Freeman, New York, N.Y., assignor to Harold Freeman Jewelry Mfg. Co., Inc., New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,518
Int. Cl.[2] A44C 9/00, 15/00
U.S. Cl. 63—15 **12 Claims**

1. A convertible finger ring comprising:

a ring band having a generally U-shape to provide a pair of spaced apart resilient arms;

an ornamental gem mount having a portion disposed between said ring band arms;

pivot means pivotally connecting said gem mount portion to said ring band arms for rotating said gem mount relative to said ring band between a ring configuration and a pendant configuration, said gem mount being disposed substantially perpendicular to said ring band in said ring configuration, with said gem mount and said ring band being disposed substantially in one plane in said pendant configuration;

positioning means for providing removable engagement between said gem mount portion and said ring band arms to selectively position said gem mount in one of said ring and pendant configurations with said resilient ring band arms maintaining said engagement;

stop means to limit the rotation of said gem mount relative to said ring band to substantially 90 degrees so that said gem mount is prevented from being rotated beyond said ring and pendant configurations;

said stop means including a pair of opposed shoulder members disposed on said gem mount for abutting against said ring band arms respectively; and

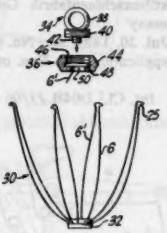
sides of said shoulder members abutting against said ring band arms in said ring configuration, and adjacent edges of said shoulder members abutting against said ring band arms in said pendant configuration, each of said shoulder member sides being substantially perpendicular to an associated one of said shoulder member edges, and said shoulder members being spaced from said pivot means to allow said shoulder members to rotate with said gem mount into abutment with said ring band arms.

4,220,018

DISPLAY DEVICE FOR ORNAMENTAL OBJECTS

Edmond H. Chuard, 35, rue de l'Athenee, Geneva, Switzerland (1206)

Filed Jun. 29, 1977, Ser. No. 811,035
Claims priority, application Switzerland, May 11, 1976, 13937/76
Int. Cl.[2] A44C 17/02
U.S. Cl. 63—29 R **11 Claims**



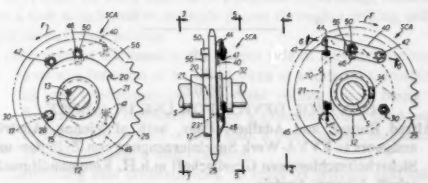
1. A display device for an ornament, comprising a pair of relatively elastic filament elements, each of said filament elements having a generally U-shaped hook formed between the free ends thereof; connecting means for holding said free ends of said filament elements; and mounting means for holding said U-shaped hooks of said filament elements, said filament elements, connecting means, and mounting means cooperating to form cage means for receiving and supporting an ornament in a freely movable manner therein, said filament elements being of a size such that an ornament disposed within said cage means is visibly displayed, and at least one of said U-shaped hooks being releasably attached to said mounting means to permit the selective interchange of ornaments.

4,220,019

SHEAR CLUTCH ASSEMBLY WITH REVERSE DRIVE MECHANISM FOR CLEARING OVERLOADS

James W. Mast; Virgil B. Martin, both of West Bend, and Roger L. Villers, Fredonia, all of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Jan. 18, 1979, Ser. No. 4,295
Int. Cl.[3] F16D 3/56, 7/00
U.S. Cl. 64—28 R **22 Claims**



1. A shear clutch assembly comprising; a first member having a periphery and a notch formed in said periphery, a second rotatable member, said first and second members each having a hole alignable with one another, shear bolt means extending through said holes when said holes are aligned, whereby said members are rotated together in a forward direction, a drive pin shiftably mounted on said second member and for rotation therewith, said pin extending from said second member and engagable with said periphery of said first member, resilient means for biasing said pin against said periphery, whereby when said shear bolt means is removed from said holes and one of said members is driven in a reverse direction, said drive pin

engages in said first member notch and said members are driven together in said reverse direction.

4,220,020

WARP KNITTING MACHINE WITH WEFT INSERTERS

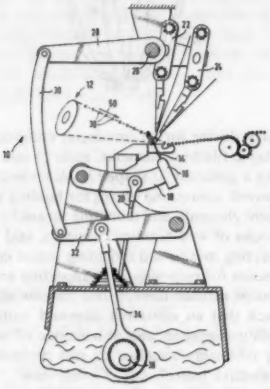
Karl Kohl, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,312

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2736977

Int. Cl.[2] D04B *23/06*

U.S. Cl. 66—84 A **1 Claim**



1. A weft inserting apparatus for use with a warp knitting machine having a needle bed, guide bar drive levers, and push rods operatively connected thereto, comprising:

(a) thread provider means for supplying a plurality of weft threads; and

(b) means for sequentially carrying each of said weft threads across the width of said machine, said carrying means being angularly disposed towards said needle bed, within the space included by said needle bed, said push rods and said guide bar drive levers.

4,220,021

CONTROL DEVICE FOR USE IN A LOCK

Alfred Burger, and Adalbert Paar, both of Vienna, Austria, assignors to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Geselischaft m.b.H. Kommanditgesellschaft, Vienna, Austria

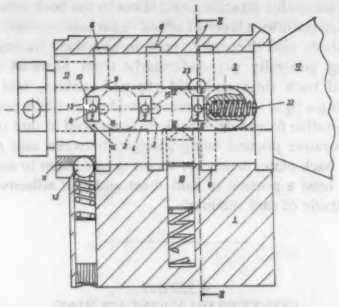
Filed Mar. 2, 1979, Ser. No. 16,893

Claims priority, application Austria, Mar. 6, 1978, 1574/78; Jun. 29, 1978, 4750/78; Jan. 5, 1979, 97/79

Int. Cl.[2] E05B *9/10, 17/04, 29/00, 47/00*

U.S. Cl. 70—276 **12 Claims**

1. A control device, particularly for use in connection with a lock, comprising a housing having on its inner surface a first guiding recess; a cylindrical plug rotatable in said housing about its center axis and defining on its surface a second recess; at least one magnetic rotor supported in said plug for rotation about an axis transverse to said center axis and defining a third recess alignable with said second recess; a control strap arranged for axial movement on said plug and being rotatable therewith; and arresting elements projecting from said strap into said first and second recesses and being axially displaceable with said strap into engagement with said third recess when the latter is in alignment with said second recess.



4,220,022

ELECTRICALLY CONTROLLED, ELECTRICALLY ENCODED PUSH-BUTTON COMBINATION LOCK

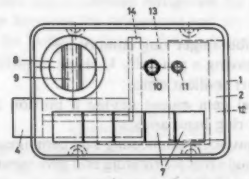
Horst Willach, Ruppichteroth, Fed. Rep. of Germany, assignor to Huwil-Werke GmbH Möbelschloss-und Beschlagfabriken, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,742

Claims priority, application Switzerland, Sep. 23, 1977, 11682/77

Int. Cl.[2] E05B *47/00*

U.S. Cl. 70—278 **27 Claims**



1. Electrically controlled, electrically encoded push-button combination lock comprising

a locking means (**4**) normally in locked condition;

a plurality of push-button switches (**7, 77**);

an encoding circuit (**13, 53**) connected to the push-button switches providing an output permitting unlocking of the locking means if, and only if, the sequence of operation of the plurality of pushbutton switches conforms to a code contained in the encoding circuit;

and comprising the combination of

a source of operating power (**12**);

a timing circuit (**50, 51, 53'**) connected to a selected one of the push-button switches (**77***e*) which, in accordance with the code, is the first one to be operated, said timing circuit also being connected to said source of operating power (**12**) and being energized thereby upon operation of said selected one of the push-button switches to start a timing interval and to remain energized during said timing interval only;

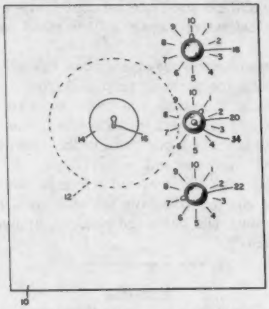
said timing circuit further controlling energization and de-energization of the encoding circuit (**13, 53**) by, and from said source of operating power to permit affecting the encoding circuit on subsequent operation of the push-button switches, said timing circuit, after elapse of said timing interval, deenergizing said encoding circuit to leave said lock in locked condition.

4,220,023

COMBINATION LOCK

Jefts G. Beede, P.O. Box T, Fayville, Mass. 01745

Filed Oct. 2, 1978, Ser. No. 947,495
Int. Cl.[3] E05B *37/02*
U.S. Cl. 70—312 **5 Claims**



1. A combination lock comprising a member movable to operate the lock and means for preventing such motion,

said means comprising two sets of a plurality of settable digitally actuated knobs, there being corresponding sets of knobs at each side of the lock,

the knobs of a first set being set in a selected series at one side of the lock, and a corresponding second set of knobs at the other side of the lock requiring corresponding settings in order to release said member to allow motion thereof,

means actuatable only upon corresponding setting of the knobs of both sets to move said member to actuate the lock,

said last named means including a barrel for each of a pair of opposite corresponding knobs, interengaging means between each knob of the first set and the barrel, and means including the barrels for selectively misaligning said interengaging means, said barrels being connected to said member to operate the lock,

the knobs of the second set at the other side of the lock being actuatable to turn the barrel to align said interengaging means,

a thimble for each knob, the knobs of the first set at the one side of the lock each being attached with respect to a thimble thereby to turn the thimble by means of the individual knobs, and a protuberance on each barrel, said thimbles each having a slot which when aligned with its respective protuberance allows the motion of the member but when misaligned prevents the same.

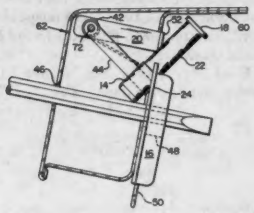
4,220,024

LOCK MECHANISM

John J. Berich, 7518 Forest View Dr., St. Louis, Mo. 63121

Filed Dec. 6, 1978, Ser. No. 966,786
Int. Cl.[2] E05B *63/00*
U.S. Cl. 70—416 **19 Claims**

1. A lock mechanism comprising a lock cylinder means, a latch assembly means and a means for actuating said latch assembly upon communication by said lock cylinder means, wherein said lock mechanism contains a tension means for maintaining the position of said lock cylinder means and actuating means and which renders the lock mechanism inoperative by moving the actuating means away from the latch assembly during the application of unauthorized force to the lock cylinder.

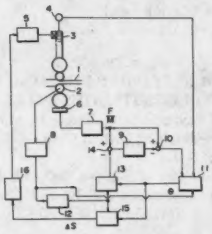


4,220,025

FEED FORWARD AUTOMATIC THICKNESS CONTROLLING METHOD

Kazushi Baba; Hisashi Miura, both of Kurashiki, and Yoshiharu Tominaga, Kobe, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Kawasaki Steel Corporation, Kobe, both of, Japan

Filed Nov. 21, 1978, Ser. No. 962,663
Claims priority, application Japan, Nov. 21, 1977, 52-139706
Int. Cl.[2] B21B *37/12*
U.S. Cl. 72—8 **3 Claims**



1. A feed forward automatic thickness controlling method for a slab which makes multiple passes through a rolling mill, said method comprising:

calibrating a thickness at the output side of a predetermined pass as a function of a rolling force at a lock on a position in said predetermined pass, said rolling force being a function of a fluctuation from a predetermined thickness in the previous pass of said slab, a deformation resistance of said slab and a mill constant;

controlling said constant lock-on level to provide said calibrated predetermined thickness in said predetermined pass, said lock on level being determined by the intersection of a plastic characteristic curve of said rolled slab at the lock on position in the previous pass of said slab and an elastic characteristic curve of said rolling mill at a press-down screw position in said predetermined pass;

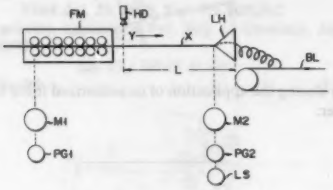
obtaining an adjusting degree of a screw gap of said press-down screw as a function of the thickness fluctuation from the predetermined thickness in said previous pass of said slab, a mill constant and a differential coefficient of a rolling load function for the predetermined thickness in said predetermined pass; and controlling said press-down screw position as a function of said adjusting degree.

4,220,026

POSITION CONTROL METHOD AND APPARATUS FOR CONTROLLING THE POSITION OF THE WIRE DISCHARGING PORT OF A LAYING HEAD

Makoto Tanaka, Fuchu, and Takayuki Matsudaira, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 1, 1978, Ser. No. 965,421
Claims priority, application Japan, Dec. 1, 1977, 52-144182
Int. Cl.³ B21B *41/10*
U.S. Cl. 72—15 **9 Claims**



1. A control method for controlling the position of the wire discharging port of a laying head which discharges a wire in a coil fashion through its revolution, comprising the steps of:

detecting signals relating to a wire running speed and an amount of revolution of said laying head;

modifying the detected wire running speed signal into a signal relating to a higher wire running speed than the former speed;

comparing the detected revolution amount signal with the modified signal when the leading end of the wire reaches an upstream position of said laying head; and

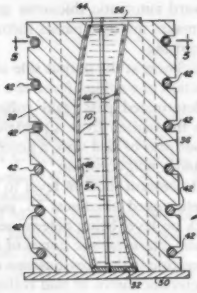
feeding a signal of the comparing result to a speed control system of said laying head.

4,220,027

METHOD FOR EXPLOSIVE FORMING OF TUBULAR MOLDS FOR CONTINUOUS STEEL CASTING

Lyle J. Johnson, Taylor, Mich.; Jimmy D. Mote, Littleton, and Jack A. Yoblin, Boulder, both of Colo., assignors to Concast, Inc., Montvale, N.J.

Continuation-in-part of Ser. No. 492,419, Jul. 29, 1974, abandoned. This application Jul. 10, 1975, Ser. No. 594,861
Int. Cl.² B21D *26/08*
U.S. Cl. 72—56 **22 Claims**



1. A method of forming an elongate hollow tubular mold member having a longitudinally extending passage therethrough, said method comprising the steps of:

inserting a hollow tubular blank into the cavity of a female die, said cavity having a configuration approximating that of the external walls of the mold member to be formed;

subjecting the inner walls of said blank to a deforming force by directing the pressure provided from detonating an explosive against said inner walls to deform the outer walls of said blank to the configuration of said cavity of said female die;

removing the deformed blank from said female die;

inserting a male die into the interior of said deformed blank, said male die having an external configuration corresponding to the desired internal configuration of the longitudinally extending passage of the mold member to be formed;

subjecting said outer walls of said blank to a deforming force by directing the pressure produced from detonating another explosive against said outer walls to deform said inner walls of said blank into a configuration wherein the passage of said blank conforms to the external configuration of said male die; and

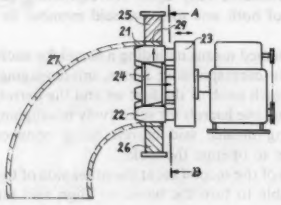
removing said male die from said deformed blank, the step of removing said male die from said deformed blank including expanding said deformed blank by applying heat energy thereto.

4,220,028

METHOD AND DEVICE FOR PRODUCING TUBE BENDS

Rolf Koser, Espelkamp-Frontheim; Egon Haberstock, Oberbauerschaft; Anton Breidenbend, Bunde, and Manfred Wonderschütz, Kirchlengern, all of Fed. Rep. of Germany, assignors to SIDRO GmbH & Co. Ludwig Möller, Bünde 1, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,482
Int. Cl.² B21D *3/14*
U.S. Cl. 72—117 **12 Claims**



1. Device for producing tube bends of a given diameter and substantially uniform wall thickness from a straight tube having a diameter smaller than the given diameter, comprising means for re-shaping end portions of tube bends to form tangentially directed cylindrical leg extensions with equal tube bend cross sections, said re-shaping means being a fixed and a movable form tool surrounding the tube bend end, each of said form tools surrounding the tube bend end having half-cylindrical die cavities formed therein, a cluster of cylindrical pressure rollers disposed about an imaginary circle and insertable into the tube bend end, and a common drive for said rollers, said rollers being slideable along the axis of said extension.

4,220,029

CONTINUOUS EXTRUSION MACHINE AND METHOD OF CONTINUOUS EXTRUSION

Nazeer Ahmed, and Myrna M. Ahmed, both of 17 Wedgewood Dr., Danbury, Conn. 06810

Filed Jun. 12, 1978, Ser. No. 914,798
Int. Cl.³ B21C *23/32, 33/00*
U.S. Cl. 72—262 **9 Claims**

1. An apparauts for the extrusion of an elongated material of unlimited length into an elongated product of unlimited length which apparatus consists of:

(a) a first torus which has a peripheral groove located astride

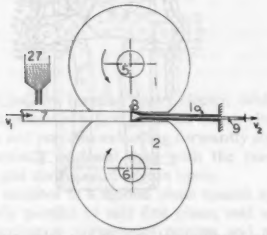
a diametral plane perpendicular to its axis of rotation and a second torus which has a peripheral groove located astride a diametral plane perpendicular to its axis of rotation, said grooves so constructed that when the first and second toruses are radially squeezed against each other the peripheral grooves cooperate to form a high pressure chamber;

(b) the said toruses so constructed that each of them can sustain a maximum radial deformation in excess of 0.2 percent without undergoing a permanent set;

(c) the said toruses mounted on shafts so that the axis of each shaft is coincident with the axis of rotation of the respective torus it supports;

(d) the said shafts housed in bearings located in a frame such that the shafts can rotate on axes parallel to each other;

(e) squeeze plate means for applying pressure on said bearings so that the two toruses are radially squeezed against each other such that each torus is subjected to a maximum



temporary radial deformation which is substantially in excess of 0.2 percent but less than an amount that causes a permanent set in either torus;

(f) a stationary die supported by a die stem and located substantially near the center of contact length formed between the said toruses;

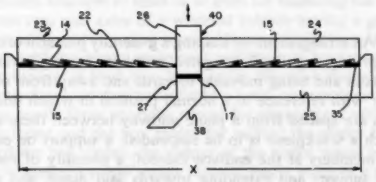
(g) motor means for rotating the said toruses so that the contact surfaces of the toruses move linearly together along the contact length and the high pressure chambers formed by the peripheral grooves which grips and pushes a suitably shaped incoming rod of unlimited length into the stationary die in such a manner that there is substantially no slippage between the incoming rod and the high pressure chamber and such that the incoming rod material suffers substantially no upset or work hardening before it enters the die wherein deformation takes place and the product exits from the die at a velocity greater than that of the incoming rod.

4,220,030

ORIENTING AND SIZING BATTERY GRIDS AND ARTICLES FORMED THEREBY

Jerry T. McDowell, Greeneville, Tenn., assignor to Ball Corporation, Muncie, Ind.

Filed Oct. 10, 1978, Ser. No. 949,934
Int. Cl.³ B21D *53/00*
U.S. Cl. 72—326 **10 Claims**



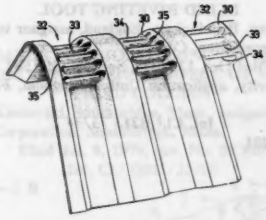
1. A method of orienting a battery grid from stock material having expanded and unexpanded portions theron wherein the unexpanded portion lies between said expanded portions thereon, said method comprising continuously advancing stock material along a predetermined path, forming a number of spaced apart cut out portions by punching out pieces on said stock material along the unexpanded portion and simultaneously pressing the expanded portions to orient and size the same.

4,220,031

METHOD FOR BENDING SECTION-SHEET, PLATE STRIP AND LIKE MATERIAL

Gustav Näslund, Älvsbyn, Sweden, assignor to Groko Maskin AB, Lulea, Sweden

Filed Jun. 17, 1977, Ser. No. 807,651
Int. Cl.² B21D *5/02, 31/00*
U.S. Cl. 72—379 **6 Claims**



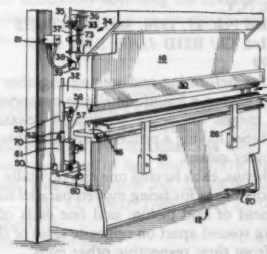
1. A method for bending a sheet having a transverse contour comprising corrugations forming a series of mutually parallel ridges and valleys with common side walls, said method including a procedure comprising supporting a portion of said sheet on one side only along interspaced mutually parallel lines of support extending transversely across the sheet for its full width and holding the sheet against displacement only in a direction right angularly away from said side and with said portion of the sheet spanned by said lines free to move in the longitudinal direction of the sheet, while pressing only on the sheet's other side along a line extending throughout the sheet's width and between said parallel lines, said pressing bending said valleys and the portions of said side walls adjacent to the valleys in said direction between said parallel lines of support so as to cause the sheet to bend.

4,220,032

POWER PRESS BREAK GUARD

Robert A. Smith, Jr., Reidsville, N.C., assignor to Air Conditioning Corporation, Greensboro, N.C.

Filed Dec. 15, 1978, Ser. No. 969,957
Int. Cl.³ F16P *3/04;* B21D *5/02*
U.S. Cl. 72—389 **10 Claims**



1. In combination with a machine having an actuated recip-

rocating working member for working a workpiece positioned in a break in said machine for receiving the workpiece, the improvement comprising:

switching means responsive to the reciprocation of said reciprocating working member;

reciprocating guard means positionally controlled by actuating means for covering a substantial portion of said break while said reciprocating working member is in a first position relative to said workpiece and uncovering said break while said working member is in a second position relative to said workpiece; and

actuating means for reciprocally actuating said guard means in response to said switching means, thereby to prevent an operator from inserting a finger into said break in said machine, when said working member is moving from said first position to said second position for working said workpiece.

4,220,033

BLIND RIVETING TOOL

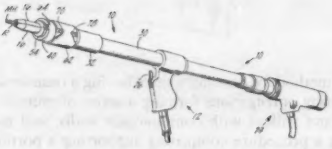
John Powderley, Birmingham, England, assignor to USM Corporation, Farmington, Conn.

Filed Oct. 12, 1978, Ser. No. 950,587

Claims priority, application United Kingdom, Feb. 1, 1978, 3955/78

Int. Cl.[2] B21J *15/34*

U.S. Cl. 72—391 **3 Claims**



1. A pull-through blind riveting tool comprising a barrel for axially receiving a mandrel adapted to slidably mount a plurality of headed rivets to be set successively, abutment members mounted on an end portion of the barrel for movement between a closed first condition in which they abut the head of a leading rivet during a rivet setting operation of the tool and to an open second condition in which a rivet can pass between the members, and a collar rotatively mounted on the front end of the barrel, said collar being formed with a cam face for displacing a cam member during rotation of the collar to urge the abutment members forwardly and radially apart and to retain said members in their open condition to facilitate loading of the tool with rivets and shiftable by rotation between said first position in which the abutment members assume said closed condition and a second position wherein the abutment members are retained in their open condition.

4,220,034

DOUBLE ACTION, SELF-CONTAINED SWAGE

Ivo C. Pogonowski, Blacksburg, Va., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,625

Int. Cl.[3] B21D *41/00*; B21J *7/16*

U.S. Cl. 72—399 **5 Claims**

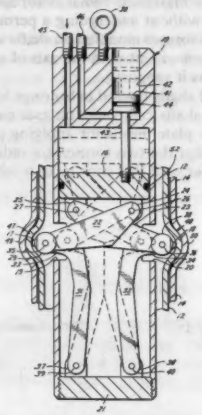
1. A swage for deforming and joining together two small telescopic tubes having a longitudinal axis comprising,

(a) cylinder means for being positioned coaxially in the telescopic tubes having a piston means operable at one end of the cylinder means,

(b) two arm means, each having one end pivotally connected to said piston means for being moved parallel to longitudinal movement of said piston, said one ends of both arm means being spaced apart on opposite sides of the longitudinal axis from their respective other ends,

(c) the other end of each arm means carries an indentation tip for engaging and deforming the inner surface of said inner tube upon outward pivotal movement of said arm means, each of said indentation tip ends being adjacent the side of the telescopic tubes opposite to the side adjacent its respective one end for forming crossed arms for generating increased indentation forces,

(d) biasing means having one end thereof pivotally connected to the other end of one of said arm means on one



side of the longitudinal axis of the telescopic tubes for pivoting said one arm means outwardly, and

(e) said biasing means being responsive to said piston means longitudinal movement for actuating said indentation tips outwardly and transversely of the small telescopic tubes for deforming two contiguous dimples in both small telescopic tubes for efficiently joining the two tubes together.

4,220,035

DEVICE FOR THE STRAIGHTENING OF THIN METALLIC PARTS ESPECIALLY SHEETS

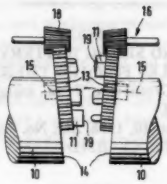
Röttger Jansen-Herfeld, Königstr. 146, Remscheid, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,873

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757906

Int. Cl.[3] B21B *37/06*

U.S. Cl. 72—413 **13 Claims**



1. An arrangement for shaping a generally planar workpiece, comprising a pair of elongated members having juxtaposed endfaces and being movable towards and away from one another with reference to a normal position in which said endfaces are spaced from a plane midway between them and in which a workpiece is to be suspended; a support on each of said members at the endface thereof; a plurality of tools on each support and extending towards said plane; and means mounting each of said supports with the tools thereon for rotation relative to the respective endface, to and from a posi-

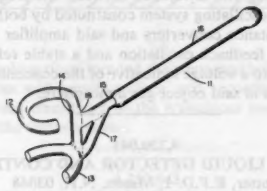
tion in which a selected one of said tools is located closest to said plane while all others of said tools are located farther from said plane so that, when said members move towards one another only the selected tools of the two supports contact a workpiece suspended in said plane.

4,220,036

HEAVY WIRE BENDING TOOL

John L. Scheetz, 365 Maxwell Ave., Oakdale, Calif. 95361

Filed Jul. 21, 1978, Ser. No. 927,122
Int. Cl.[2] B21D *7/00*
U.S. Cl. 72—458 **2 Claims**



1. A hand tool for bending heavy electric cable comprising:

a lower member in a first plane having a closed rearward portion and portions extending forwardly so as to define a first partially enclosed area with the rearward region closed and the forward region open;

an upper member in a second plane spaced apart from and generally parallel to said first plane, said upper member commencing at a rearward portion and extending forwardly and laterally so as to define a second partially enclosed area in substantial alignment with said first partially enclosed area said second partially enclosed area being partially open in the rearward region and substantially closed in the forward region for holding said heavy cable extending between first and second enclosed areas;

a spacing member interconnected with the rearward portion of said lower member and extending to and interconnected with the rearward portion of said upper member; said upper, lower and spacing member being comprised of a material cylindrical in cross-section; and a hand-holdable handle member extending rearwardly from and substantially perpendicular to said spacing member so as to apply mechanical advantage to said interconnected members to cause the rotation thereof in a plane substantially vertical to the aforesaid first and second planes whereby said upper and lower members engage the heavy cable causing it to bend without damage to electrical properties of insulation of wire.

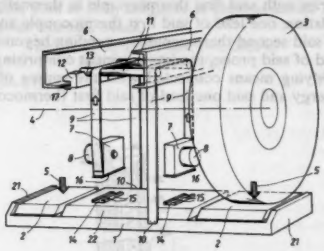
4,220,037

WEIGHING SCALE CALIBRATING MACHINE

Ake Widehn, Vesteras, Sweden, assignor to ASEA AB, Vesteras, Sweden

Filed Feb. 1, 1979, Ser. No. 9,400
Claims priority, application Sweden, Feb. 6, 1978, 7801327
Int. Cl.[3] G01G *23/00*
U.S. Cl. 73—1 B **2 Claims**

1. A loading machine for use in the caliberation of strain transducers attached to axles or to arms for balancing the load between two rear axles of a wheeled vehicle having a girder frame and ground engaging wheels, the machine being adapted for use with weighing equipment including at least one box girder having at least two load scales disposed thereon for respectively supporting two of said wheels, the machine comprising tensile force applying means for engagement with the girder frame and the box girder for pulling the girder frame toward the box girder, the output of the scales when tensile force is applied by said means representing a value of a simulated load on the vehicle, whereby the machine establishes a measured accurate and controlled wheel force giving a known defined and simultaneous loading on the axles and/or the balancing arms for creating controlled mechanical stress in the



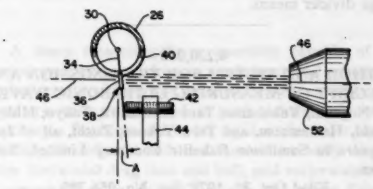
axles and/or the balancing arms and thus simulating a vehicle load giving the same wheel force.

4,220,038

APPARATUS FOR MONITORING INSTRUMENT READINGS OF TRANSIENT FORCE OF A MOVING FLUID COLUMN

Joseph W. Kantorski, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jul. 9, 1979, Ser. No. 55,840
Int. Cl.[3] G01L *25/00*
U.S. Cl. 73—1 B **2 Claims**



1. Apparatus for monitoring transient force of a moving fluid column comprising:

a paddle having a lever arm and disc carried by said arm;

paddle carrying means from which said lever arm depends, said carrying means resisting relative swinging movement of said paddle;

means for supporting both said paddle and carrying means with said paddle in a position within a path along which a moving fluid column is to be monitored;

means for aligning said disc of said paddle centrally in said path of said moving fluid column, said aligning means including a simulated ocular cornea fixed at a known position on said paddle supporting means relative to said paddle disc; and

means for selectively adjusting the resistance of said carrying means to said relative swinging movement of said paddle.

4,220,039

FLUID TEMPERATURE COMPENSATOR CIRCUIT FOR A THERMAL GAUGE PROBE

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108

Continuation-in-part of Ser. No. 918,879, Jun. 26, 1978, abandoned. This application Jul. 31, 1979, Ser. No. 62,382
Int. Cl.[3] G01F *1/68*; G01N *25/00*
U.S. Cl. 73—15 R **3 Claims**

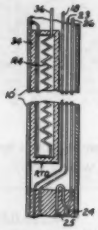
1. In combination with

a tubular thermal gauge probe having a heater connected with a source of electrical energy and disposed within one

fluid entering closed end portion and having a first thermocouple disposed within the heater,

a second thermocouple within said probe and connected in series with said first thermocouple in thermally insulated relation, one lead of said first thermocouple and one lead of said second thermocouple extending beyond the other end of said probe, the improvement comprising:

amplifying means connected with the source of electrical energy and said one lead of said first thermocouple;



voltage divider means including a resistance thermal device interposed between said second thermocouple and said amplifying means for applying a constant value correctional voltage to said amplifying means as a function of fluid temperature; and,

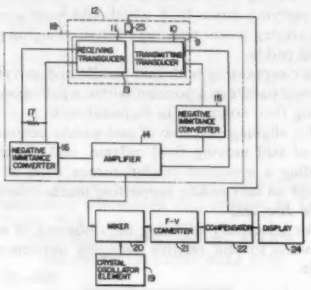
voltage regulator means including a voltage regulator connecting the source of electrical energy with said heater, said one lead of said second thermocouple and said voltage divider means.

4,220,040

METHOD AND SYSTEM FOR TRANSMISSION AND RECEIPT OF MEASURING ULTRASONIC WAVE

Yasuo Noguchi, Yokohama; Taro Kokuzawa, Tokyo; Hideyuki Suzuki, Hamamatsu, and Toru Yokose, Zushi, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

Filed Oct. 31, 1978, Ser. No. 956,295
Claims priority, application Japan, Jun. 27, 1978, 53-76991
Int. Cl.[3] G01N *29/02*
U.S. Cl. 73—24 **3 Claims**



1. A method for measuring a gas concentration comprising the steps of:

(a) transmitting an ultrasonic wave from a transmitting transducer through an object gas atmosphere to a receiving transducer, said transmitting transducer including an electrostrictive element controlled by a circuit by which negative impedance generated from a negative immitance converter offsets impedances including damping impedance of said transmitting transducer, output impedance of an amplifier for driving said transmitting transducer and impedance between said transmitting transducer and said amplifier, said negative immitance converter being inserted between said transmitting transducer and said amplifier, and said receiving transducer for receiving the ultrasonic wave and converting it into electric energy including an electrostrictive element controlled by a circuit by which negative admittance generated by another negative immitance converter inserted between said receiving transducer and said amplifier which also amplifies an output of said receiving transducer offsets admittances including load admittance and damping impedance of said receiving transducer; and

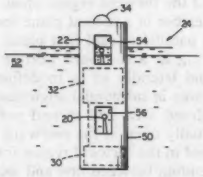
(b) converting the difference between the frequency of a feedback oscillating system constituted by both said negative immitance converters and said amplifier which also functions feedback oscillation and a stable reference frequency into a voltage indicative of the concentration of an object gas in said object gas atmosphere.

4,220,041

ALIEN LIQUID DETECTOR AND CONTROL

Bronson M. Potter, R.F.D. 1, Mason, N.H. 03048

Continuation-in-part of Ser. No. 785,347, Apr. 7, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,899
Int. Cl.[3] G01N *25/18*
U.S. Cl. 73—61.1 R **18 Claims**



1. A detector for detecting an alien immiscible liquid in the presence of a desired liquid, e.g., for detecting oil pollution at a surface boundary of water, comprising a monitoring element exposed for heat transfer contact with said alien liquid when present, said monitoring element having an electrical characteristic that changes as a single-valued function of temperature, an electronic circuit to control the flow of heating current to said element to establish the temperature of said element at a value substantially above ambient temperature, said circuit including reference means representing a predetermined desired value for said electrical characteristic of said monitoring element and being adapted, upon change in the actual value of said electrical characteristic of said monitoring element, to change said heating current flow to said monitoring element to restore the value of said characteristic toward said predetermined desired value, and an alien liquid indicator circuit responsive to a predetermined change in said heating current flow to said monitoring element for indicating the presence of said alien liquid, said predetermined change related to the difference in the specific heats of the alien and the desired liquids.

4,220,042

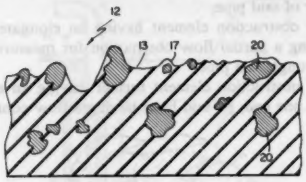
MEASUREMENT OF CARBON BLACK DISPERSION

Paul C. Vegvari, Burlington; William M. Hess, Trenton, and Vincent E. Chirico, Hamilton Sq., all of N.J., assignors to Columbian Chemicals Company, Tulsa, Okla.

Filed Mar. 26, 1979, Ser. No. 23,577
Int. Cl.[2] G01N *19/08, 33/34*
U.S. Cl. 73—150 R **4 Claims**

1. A method for determining the degree of dispersion of carbon black in a rubber sample, comprising cutting said sample with a cutting element, thereby obtaining a sample surface,

contacting (a) said surface of said rubber sample with a height measuring transducer, which supplies a current output at a voltage which varies in correspondence to the height of peaks



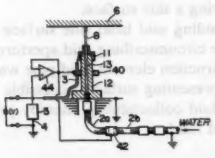
on said sample surface, moving the contacted height measuring means across said sample surface, and recording the voltage output of said transducer as the transducer means moves up and down the surface peaks.

4,220,043

DEVICE AND METHOD FOR MEASURING THE PROFILE OF A PLATE

Sadao Ebata, Okayama, Japan, assignor to Kawasaki Steel Corporation, Hyogo, Japan

Filed Dec. 6, 1978, Ser. No. 966,944
Claims priority, application Japan, Dec. 8, 1977, 52-147962
Int. Cl.³ G01B *13/12, 13/16, 13/22, 13/24*
U.S. Cl. 73—159 **8 Claims**



1. A device for measuring the profile of a plate comprising:

a plurality of aligned waveshape detectors for detecting a plurality of waveshapes and for generating a plurality of waveshape signals, each of said waveshape detectors comprising a plurality of nozzles arranged in a widthwise direction of the plate which injects water continuously and uniformly towards the surface of the plate and vertical displacements of the plate are measured by said waveshape detectors as electrical resistance of the injected water between the nozzles and said plate, each of said nozzles of said waveshape detectors each comprising:

a nozzle tip for injecting water toward a travelling plate and to which a voltage is applied;

a support member made of electrically insulated material for supporting said nozzle tip;

a case spaced apart from said support member and covering said support member and forming at one end an opening adjacent to said nozzle tip;

a means for feeding gas under pressure to the interior of said case, said case, support member and nozzle tip being arranged and configured such that gas under pressure flows between said case and said support member and is blown out of said opening in said case;

a waveshape processing means for determining signal variation values from the waveshape signals within small periods of time and for summing the signal variation values over a predetermined period of time; and

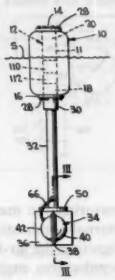
a subtracting means for comparing the summed signal variation values and for generating outputs corresponding to distortion in the profile of the plate.

4,220,044

WAVE MEASURING BUOY

Lester R. LeBlanc, Narragansett, and Foster H. Middleton, Peace Dale, both of R.I., assignors to Environmental Devices Corporation, Marion, Mass.

Filed May 2, 1979, Ser. No. 35,345
Int. Cl.³ G01W *1/00*
U.S. Cl. 73—170 A **7 Claims**



1. A wave measuring buoy assembly capable of being launched and retrieved from a small boat and which when launched tends to follow the wave surface and in the course of following a wave surface tends to pitch and roll, said assembly comprising a flotation hull and a rigid, underwater assembly depending therefrom, said underwater assembly having a greater horizontal drag than said hull, said underwater assembly comprising a water-proof housing and means fixing said housing to said hull and spaced therebelow, said hull being adapted to support said underwater assembly therebeneath in a body of water, said housing being spaced below said flotation hull a distance such that as the buoy assembly rolls or pitches under the influence of wave motion it stabilizes itself by acting as an inverted pendulum, the center of rotation of which is said housing, whereby said inverted pendulum when on the front of a wave passing thereunder swings around said housing in the direction of propagation of said wave and swings in the opposite direction as the crest of the wave passes thereunder to position it on the back side of said wave, said buoy assembly having a horizontal center-line, an accelerometer suspended in said housing for pivotal motion relative thereto, a two axis inclinometer having said two axes at substantially 90° to each other fixed to said buoy assembly and a compass having a north-south axis mounted on said buoy assembly, said inclinometer and said compass being so positioned with respect to each other and to said buoy assembly that one inclinometer axis makes a predetermined angle with said horizontal center-line and the north-south axis of said compass also makes a predetermined angle with said horizontal center-line, each axis of said inclinometer being adapted to produce an output signal related to tilt of said buoy assembly, said compass being adapted to produce an output signal related to the compass bearing of said horizontal center-line and said accelerometer being adapted to produce an output signal when said buoy assembly is lifted by the front of a wave, and means to process the output signals from said inclinometer, said compass and said accelerometer to indicate the direction of a wave passing under said buoy assembly.

4,220,045

MASS FLOW MEASURING APPARATUS

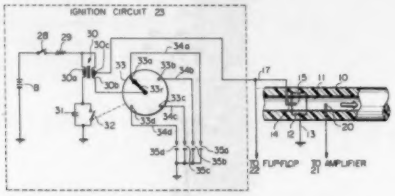
Suzuo Suzuki, Yokosuka; Hiroyuki Maruoka, Yokohama; Hatsuo Nagaishi, Yokosuka, and Yuji Matsubara, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 865,185, Dec. 28, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 963,714

Claims priority, application Japan, Jan. 10, 1977, 52/1792

Int. Cl.[2] **G01F** *1/56, 1/76*

U.S. Cl. 73—861.05 **4 Claims**



1. Apparatus for measuring the mass flow of fluids passing therethrough for an internal combustion engine equipped with an ignition circuit for igniting the air-fuel mixture in the cylinders of the internal combustion engine, said ignition circuit including a secondary circuit, an ignition coil having a secondary winding and a tap on said winding, and a common terminal connected to ground, said apparatus, comprising:

(a) first and second electrodes disposed in the path of fluid flow for ionizing the fluid to generate an electrically distinguishable fluid mass from the surrounding mass of fluid, said electrically distinguishable fluid mass migrating with said surrounding fluid between first and second predetermined points along the path of fluid flow, said first and second electrodes being disposed at said first predetermined point, said second predetermined point being located downstream of said first predetermined point;

(b) means for applying a high DC voltage in response to a train of ignition pulses generated in said ignition circuit across said first and second electrodes for biasing said first and second electrodes at opposite potentials at intervals, said means including first and second conductors connecting the secondary circuit of said ignition circuit to said first and second electrodes, said first conductor being connected to said tap of the secondary winding of the ignition coil, said second conductor being connected between said second electrode and ground to which the common terminal of said ignition circuit is connected;

(c) means for detecting the presence of said electrically distinguishable fluid mass at said second predetermined point and providing an output indicative of said presence; and

(d) means, responsive to said output, for determining a transit time of said electrically distinguishable fluid mass over the distance between said first and second predetermined points.

4,220,046

FLOWMETERING APPARATUS

George E. Sqourakes, Millis, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Dec. 20, 1978, Ser. No. 971,608

Int. Cl.[3] **G01F** *1/32*

U.S. Cl. 73—861.22 **8 Claims**

1. A flowmeter of the flow obstruction type for use in sanitary applications comprising:

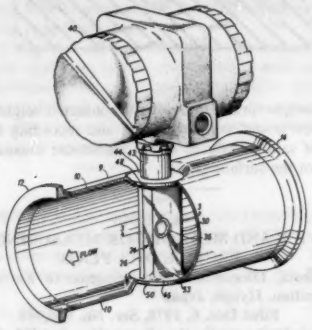
a pipe for carrying a flowing fluid, said pipe having a wall with a curved surface, said curved surface having at least one flatened section, said flatened section having inner and outer surfaces and containing an aperture;

a flow obstruction element;

means for mounting said flow obstruction element in the interior of said pipe;

said flow obstruction element having an elongate section providing a partial flow obstruction for measuring flow rate through said pipe;

said flow obstruction element further having an enlarged head at one end; p1 said head having a flow contact surface of low fluid collectability which is co-planar with said inner surface of said flatened section at least in the region of the perimeter of said flow contact surface;



said head having a side surface;

means for bonding said head side surface to the pipe wall side surface circumscribing said aperture;

said flow obstruction element, said pipe wall and said bonding means presenting surfaces accessible to said fluid that have low fluid collectability, thereby preventing entrapment of said fluid.

4,220,047

FUEL TANK GAUGE

Jöel Mauboussin, Bezons, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Jan. 15, 1979, Ser. No. 3,643

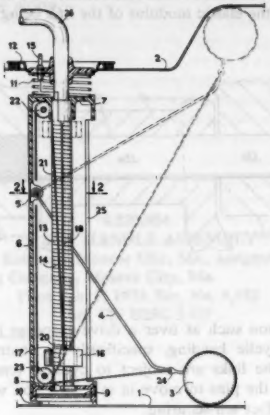
Claims priority, application France, Feb. 22, 1978, 78 05025

Int. Cl.[3] **G01F** *23/10;* **H01L** *10/10*

U.S. Cl. 73—313 **7 Claims**

1. A gauge, in particular for a liquid tank, such as a fuel tank, comprising a pivotal float, a pivotable arm pivotally connected to a member mounted within said tank and carrying the float, a rheostat wound on a first tube which is placed substantially vertically in the tank, a sliding contact cooperative with the

rheostat and guided by said first tube, upper and lower pulleys, a flexible threadlike element which extends around upper and



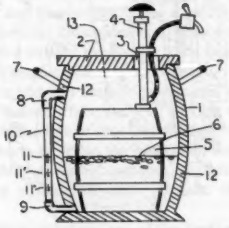
lower pulleys, and drivingly connects the sliding contact to the float at a given point of said arm adjacent the float.

4,220,048

COOLER AND LEVEL INDICATOR FOR BEER KEGS

John A. Grepiotis, and Joseph A. Grepiotis, both of 3981 Frandon Ct., Simi Valley, Calif. 93063

Filed Jun. 15, 1979, Ser. No. 48,806
Int. Cl.³ G01F *23/02, 23/06*
U.S. Cl. 73—323 **5 Claims**



1. An apparatus for the chilling and gauging of beer kegs comprising:

a. a thermally insulated container of sufficient size to hold a keg of beer and a quantity of iced water;

b. a thermally insulated and perforated cover for said container;

c. level detecting means for measuring the height of said iced water when the keg is in place in said insulated container along with a measured amount of said iced water;

whereby the chilling time of the iced water is extended as a result of the isolating effect of the insulation and the quantity of beer in the keg can be inferred from said level detecting means.

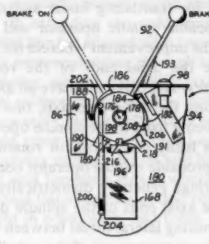
4,220,049
Patent Not Issued For This Number

4,220,050

CONTROL SYSTEM ACTUATING ASSEMBLY

Larry D. Friesen, and Stephen L. Palmer, both of Dallas, Oreg., assignors to Towmotor Corporation, Mentor, Ohio

Division of Ser. No. 796,568, May 13, 1977, Pat. No. 4,136,752.
This application Sep. 26, 1978, Ser. No. 945,959
Int. Cl.³ G05G *17/00*
U.S. Cl. 74—2 **6 Claims**



1. A control system actuating assembly **(172)** for engaging a vehicle brake **(18)**, comprising:

bearing means **(178)** having an axis **(176)**;

first and second juxtaposed elements **(174,198)** mounted on said bearing means **(178)** and being individually pivotable about said axis **(176)** between first and second positions, said first element **(174)** having an actuating cam **(186)** thereon;

a brake actuating member **(188)**;

biasing means **(200)** for continually urging said second element **(198)** pivotally toward said second position;

retention means **(218)** for retaining said second element **(198)** in said first position;

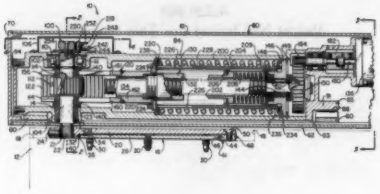
release means **(168)** for releasing said retention means **(218)** and permitting said second element **(198)** to be moved toward said second position by said biasing means **(200)**, said second element **(198)** contacting said first element **(174)** in said first position, automatically moving said first element **(174)** toward said second position and engaging said actuating cam **(186)** against said brake actuating member **(188)** to engage the vehicle brake **(18)**.

4,220,051

ELECTROMECHANICAL DOOR OPERATOR

John C. Catlett, Avon, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed May 15, 1978, Ser. No. 905,767
Int. Cl.[2] E05F *11/00*; F16H *27/02*
U.S. Cl. 74—89.15 **25 Claims**



1. In a door operator having a rotary spindle with a coaxial spindle drive gear and operable in opposite angular directions thereof for opening and closing a swinging door, a reciprocable spindle operator with a rack gear in mesh with the spindle drive gear, mounted for linear movement perpendicular to the spindle axis in opposite linear directions corresponding to rotation of the spindle in opposite angular directions respectively, a rotary electric drive motor, and a drive mechanism interconnecting the rotary electric motor and reciprocable spindle operator having a ball drive screw with an axis parallel to the axis of reciprocable movement of the spindle operator and a recirculating ball, drive nut mounted on the drive screw for relative rotation for translating linear and rotary motion between the reciprocable spindle operator and rotary drive screw respectively, the improvement wherein the spindle drive gear is intermediate the axial ends of the rotary spindle, wherein the drive screw and drive nut have an axis perpendicular to and intersecting the drive gear axis, one of said drive screw and drive nut being fixed to the spindle operator, and the rotary electric motor being connected for rotating the other, and wherein the reciprocable spindle operator comprises a pair of lateral thrust bearings generally diametrically of the rack gear and on opposite axial ends of the spindle drive gear respectively, for transmitting lateral thrust between the rack gear and spindle during linear movement of the spindle operator.

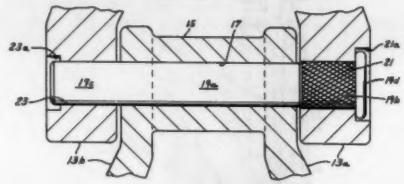
4,220,052

PIN RETENTION BY INTERFERENCE FIT DIFFERENTIAL

Jerome F. Sheldon, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed May 25, 1979, Ser. No. 42,395
Int. Cl.[3] F16G *13/06*
U.S. Cl. 474—207 **11 Claims**

1. A chain link having spaced sidebars provided with aligned bores and a round pin having one end which is press fitted in one bore and having its other end supported in the other bore with a moderate fit, the pin and link having cooperating abutment means which prevent movement of the pin in the direction from said one bore toward said other, the beam strength of the pin and the elastic modulus of the link being such that in



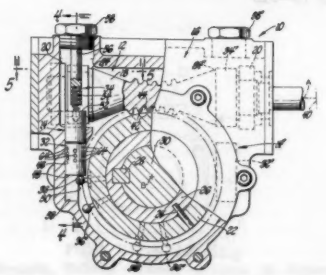
chain operation such as over a drive sprocket the pins are subject to cyclic bending, specifically as centrally loaded beams and the links are subject to cyclical tensile stresses which cause the pins to move in said direction whereby the pins are in effect self-securing.

4,220,053

STOP MECHANISM FOR WORM GEAR SET

Roland J. Barlow, Madison Heights, and Gary M. Smith, Livonia, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 30, 1979, Ser. No. 25,623
Int. Cl.[3] F16H *1/16*
U.S. Cl. 74—425 **15 Claims**



1. In a worm gear set including a worm and a gear meshed with the worm and driven by rotation thereof, a stop mechanism comprising: a blocking member that is moved to a blocking position as the gear approaches an extreme of movement in one direction; and a stop on the worm that is free to rotate until the blocking member reaches the blocking position whereupon worm rotation engages the stop with the blocking member to

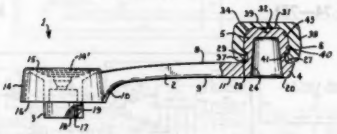
prevent further rotation of the worm in order to thereby limit the extent of gear movement in said one direction while preventing lockup of the worm and gear by excessive torque applied to the worm.

4,220,054

CRANK HANDLE ASSEMBLY

Lorraine O. Kuhlman, Monroe City, Mo., assignor to Kuhlman Diecasting Company, Monroe City, Mo.

Filed Feb. 2, 1979, Ser. No. 9,392
Int. Cl.² B25G *3/00*
U.S. Cl. 74—545 **3 Claims**



1. A crank handle assembly comprising:

(a) an elongate crank arm having spaced end portions;

(b) means at one said end portions and extending therefrom for operatively connecting same to a mechanism operative in response to rotation of said means;

(c) a handle mounting knob at the other said end portion and extending therefrom in a direction opposite to said means, said knob having an end surface and a generally cylindrical outer surface and an annular groove between the said cylindrical outer surface and the crank arm with a merging surface between the groove and cylindrical outer surface defining a shoulder facing said crank arm;

(d) a handle of resilient material having a cavity therein opening at an end thereof with the other end closed and defining a substantially cylindrical inner surface, cavity end surface and an annular flange adjacent said open end forming a shoulder facing said end surface with the cavity of a shape and size for the handle to be engaged over said knob and rotatable thereon with the cavity cylindrical inner surface and end surface in bearing contact with the cylindrical outer surface and end surface respectively of the knob and the flange shoulder engaged with the shoulder of the knob to retain the handle on the knob;

(e) the shoulder forming merging surface between the groove and cylindrical outer surface of the knob is rounded;

(f) the cylindrical outer surface of the knob merges into the end surface thereof on a radius providing a rounded surface;

(g) the cavity in the handle has corresponding rounded surfaces where the cylindrical inner surface thereof merges into the shoulder of the annular flange and into the end surface respectively for bearing contact with the respective said merging rounded surfaces of the knob; and

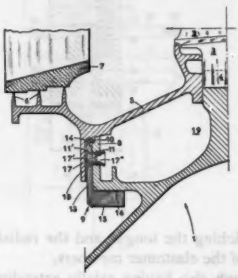
(h) said knob has an axial recess in the end thereof with the outer portion rounded and on the same radius as the rounded surface of the cylindrical outer surface and end surface of the knob.

4,220,055

DEVICE TO BALANCE A ROTOR

Claude Dubois, Vert St. Denis, and Jean M. Surdi, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sep. 20, 1978, Ser. No. 944,206
Claims priority, application France, Sep. 23, 1977, 77 29241
Int. Cl.² F16F *15/22*
U.S. Cl. 74—573 R **3 Claims**



1. In a balancing device for a rotor having a flange defining a flat radial surface with a series of spaced orifices to receive fastening means for balancing weights, and a radially inwardly facing cylindrical surface on said flange, the improvement comprising:

an annular groove in said radial surface of said flange;

a balancing weight of L-shape cross section having one leg extending generally radially along said radial surface and having a rib extending into said annular groove, a hole through said one leg aligned with one of said orifices with a fastening means extending through both, the other leg of said balancing weight extending axially and having a cylindrical surface facing radially outwardly and engaging said inwardly facing cylindrical surface; and

a ring on said rotor facing said radial surface and having a recess receiving said one leg of said balancing weight and overlying said fastening means whereby, in the event of failure of said fastening means, said rib and ring will retain said weight in position on said rotor.

4,220,056

TORSIONAL VIBRATION DAMPER

Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Sep. 19, 1978, Ser. No. 944,196
Int. Cl.² F16F *15/10*
U.S. Cl. 74—574 **2 Claims**

1. A torsional vibration damper including,

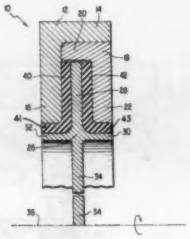
(a) an annular inertia ring formed of two annular pieces, each piece being of generally L-shape in half-axial cross-section defining axially and radially extending legs, the axially extending legs of said L-shape pieces having a common surface of junction, one of said axially extending legs being positioned radially inwardly of the other, the radially extending legs of the said L-shape pieces, together with the said axially extending legs defining a generally U-shape in half-axial cross-section,

(b) an annular hub,

(c) a radially outwardly extending tongue carried by the hub and integral therewith,

(d) a pair of annular elastomer members each having a radially extending portion, which portions sandwich the tongue, said elastomer members also each having an axially extending portion, said elastomer members being generally L-shape in half-axial cross-section,

(e) the radially extending portions of the L-shape pieces



sandwiching the tongue and the radially extending portions of the elastomer members,

(f) said hub also having axially extending flanges radially inwardly of said inertia ring, said hub flanges and said inertia ring sandwiching the said axially extending elastomer portions,

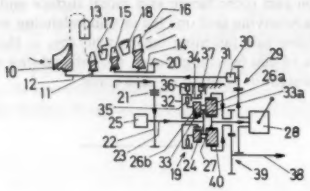
(g) whereby the elastomer members cooperate with the inertia ring and hub to damp torsional vibrations of the hub.

4,220,057

GAS TURBINE-TRANSMISSION PLANT

Sven-Olof Kronogård, Karstorpsvägen 31, Lomma, Sweden 23400

Filed Sep. 20, 1977, Ser. No. 835,035
Claims priority, application Sweden, Sep. 24, 1976, 7610579
Int. Cl.[2] F16H *47/08*
U.S. Cl. 74—688 **4 Claims**



1. An automotive gas turbine-transmission plant comprising a compressor, a first turbine driving the same, at least one power turbine, as well as conventional auxiliaries,

(A) said first turbine being undersized with respect to the power consumption of the compressor during normal operation,

(B) a stepped planetary gearing interconnecting said first and said at least one power turbine and including first and second sun wheels, a planet carrier supporting a set of stepped planet gear wheels a planet gear wheel having a small diameter at one end thereof and a planet gear wheel having a big diameter at the other end, as well as at least one ring wheel,

(C) first means to transfer power input from said at least one power turbine to said gearing by way of said planet carrier,

(D) second means to extract power from the gearing to an output shaft, as well as for driving said auxiliaries externally from one end of said planetary gear wheels,

(E) third means, cooperating with the other end of said planetary gear wheels, for changing the gear ratio between input and output at the gearing, said third means including a lamella clutch surrounded by a rotatable casing which is mounted on said first sun wheel, and a housing enclosing the gearing, and in which the first sun wheel, cooperates internally with the small diameter planetary gear wheel, said lamella clutch having a first lamella, and a second lamella, said first lamella being adapted to lock said planetary gear wheels in relation to said rotatable casing, said second lamella being adapted to lock said rotatable casing in relation to said housing, and

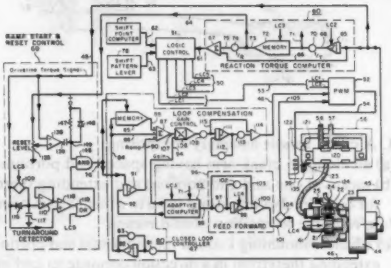
(F) fourth means to extract power for augmenting said first turbine internally from one end of said planet wheels.

4,220,058

ELECTRONIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Werner P. Petzold, Harwood Heights, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 1, 1978, Ser. No. 939,029
Int. Cl.[2] F16H *3/74*
U.S. Cl. 74—751 **9 Claims**



1. An electronic control system for regulating the change of gear ratio in an automatic transmission having a pair of friction elements and an output mechanical driving connection for supplying driveline torque to a load, where an upshift change of gear ratio has an initially occurring static phase, during which one of the friction elements is released and the driveline torque drops to a minimum turnaround level, and a subsequently occurring dynamic phase during which the other friction element is engaged and the driveline torque increases from the turnaround point until the shift is completed, comprising:

monitoring means for sensing the driveline torque at the transmission output driving connection and for producing an output torque signal which varies as a function of the driveline torque;

a closed loop control system having a loop which, when closed, controls the engagement of the on-coming friction element to regulate the driveline torque;

detecting means responsive to said output torque signal for closing the loop, when said driveline torque is generally at its turnaround point, and for causing the driveline torque to increase, from the turnaround point, under the control of a predetermined first ramp command;

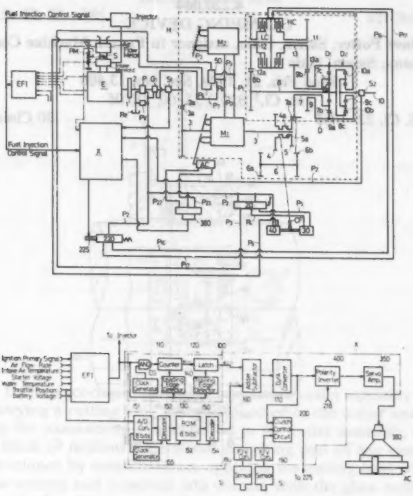
and rest means responsive to said output torque signal for releasing and resetting said closed loop control system when the driveline torque increases to a predetermined reset level during the dynamic phase, the driveline torque thereafter increasing from the reset point, under the control of a predetermined second ramp command, until the shift is completed.

4,220,059

SPEED RATIO CONTROL SYSTEM FOR STEPLESS TRANSMISSION OF VEHICLES

Kiyofumi Mizuno, Nagoya; Hiroaki Maeda, Toyota; Shigeo Takahashi, Kariya; Masanori Sato, and Satomi Suzuki, both of Nagoya, all of Japan, assignors to Aishin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1978, Ser. No. 961,068
Claims priority, application Japan, Nov. 21, 1978, 53-139679
Int. Cl.[2] B60K *41/18;* F02B *3/00*
U.S. Cl. 74—865 6 Claims



1. A speed ratio control system for a stepless variable speed transmission associated with a vehicle comprising means for producing a first signal indicative of a fuel injection duration in response to a fuel injection control signal supplied by an electronic fuel injection system, means for producing a second signal indicative of a target fuel injection which corresponds to a throttle opening of an engine, and means for comparing the first and the second signal to produce a speed ratio controlling signal which is used to control the speed ratio of the stepless variable speed transmission until the fuel injection indicated by the fuel injection signal from the electronic fuel injection system becomes equal to the target fuel injection quantity.

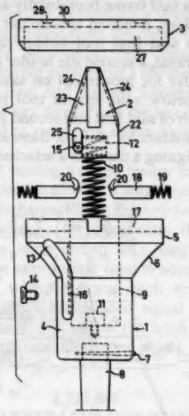
4,220,060

TOOL FOR DEBURRING TUBES OF DIFFERENT WIDTH

Ole J. Björdstrup, Vildrosvägen 19, S-574 00 Vetlanda 2, Sweden

Filed Feb. 26, 1979, Ser. No. 15,008
Int. Cl.[2] B23B *3/22, 51/00*
U.S. Cl. 82—4 C 7 Claims

1. A tool for deburring tubes of different width comprising means for securing the tool in a rotor machine; a holder connected to said tool securing means and holding a number of cutters located in grooves in said holder and having deburring edges, which face away from said tool securing means; and a guide stud, which is substantially coaxial with said holder and said tool securing means and comprises a substantially conical portion for centering the tube to become deburred with respect to said cutter holder, said conical portion facing away from said tool securing means, wherein said cutters and said guide



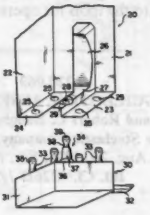
stud are elastically movable with respect to each other under the influence of spring means.

4,220,061

TURNING-TOOL MOUNTING ON A MACHINE TOOL

Yoshihiro Tsukiji, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 9, 1979, Ser. No. 2,233
Claims priority, application Japan, Jul. 21, 1978, 53-99626[U]
Int. Cl.[2] B23B *29/00*
U.S. Cl. 82—36 R 13 Claims



1. In a machine tool, in combination, a ram bifurcated to provide a pair of spaced-apart legs, a turrethead mounted between the pair of legs of the ram, a turning tool including a mounting body and a cutter carried thereby, the mounting body of the turning tool being disposed in contact both with the legs of the ram and with the turrethead, and means for removably securing the mounting body of the turning tool to at least either of the ram and the turrethead.

4,220,062

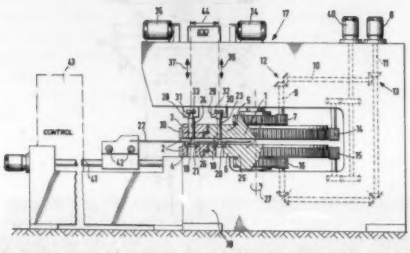
MACHINE HAVING A PLURALITY OF RECIPROCATING WORKING TOOLS WHICH MAY BE SELECTIVELY BROUGHT INTO OPERATION

Karl Blanz, Stuttgart, Fed. Rep. of Germany, assignor to Trumpf Maschinen AG, Switzerland

Filed Aug. 23, 1978, Ser. No. 935,952
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738344
Int. Cl.[3] B26F *1/04*
U.S. Cl. 83—71 8 Claims

1. A machine having a plurality of reciprocating working

tools, comprising a machine frame, a first tool holder mounted on said frame for displacement backwardly and forwardly on said frame, a first die holder arranged below said tool holder for movement on said frame backwardly and forwardly below said first tool holder, a second tool holder mounted for movement parallel to said first tool holder backwardly and forwardly on said frame, a second die holder mounted below said second tool holder for movement on said frame backwardly and forwardly below said second tool holder, drive means connected to each of said first and second tool holders and first and second die holders for shifting them along said frame and for selectively aligning a die with a selected tool of each of said



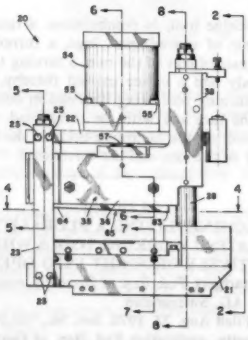
first and second tool holders and die holders, workpiece holding means mounted on said frame for movement backwardly and forwardly thereon and longitudinally therealong, means connected to said workpiece holder for moving said holder to present a workpiece between said respective first and second tool holders and first and second die holders for operation thereon by the tools in cooperation with their respective die, reciprocating means on said frame mounted above said tool holder including a ram engageable with respective tools in said tool holders which are aligned therewith to reciprocate said tools, means for shifting said ram to change the orientation thereof in respect to the tools for operating on selective ones of said tools.

4,220,063

GUILLOTINE ASSEMBLY

Ralph F. Kiemer, and Robert C. Baugher, both of Akron, Ohio, assignors to The Steelastic Company, Akron, Ohio

Filed Aug. 24, 1978, Ser. No. 936,564
Int. Cl.[2] B26D *1/08*
U.S. Cl. 83—635 **10 Claims**



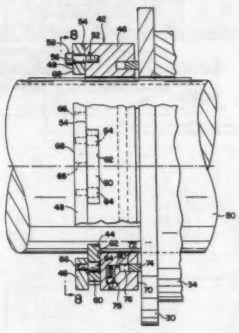
1. A guillotine assembly comprising: a basal platform; an anvil blade; means to secure said anvil blade to said basal platform; at least a pair of laterally spaced pillars having parallel axes and being secured to and extending upwardly from said basal platform; at least one bearing means slidably received on each said pillar; a beam suspended between said bearing means; an upper blade carried on said beam; the bearing means slidably received on one said pillar being rigidly affixed to said beam and being also rotatably received on said pillar; the bearing means slidably received on the other said pillar being floatingly supported from said beam whereby to accommodate interference between said upper and anvil blades by permitting limited progressive lateral movement between the beam and said other pillar.

4,220,064

CLAMPING DEVICE

Robert Potter, Salem, Ohio, assignor to Paxson Machine Company, Salem, Ohio

Filed Feb. 21, 1979, Ser. No. 13,400
Int. Cl.[3] B23D *35/00, 19/06*
U.S. Cl. 83—665 **30 Claims**



1. A shaft clamping collar comprising:
(a) a first member adapted to encircle a shaft;
(b) a second member adapted to encircle said shaft and to interface with said first member;
(c) means to secure said second member to said first member for relative arcuate shifting therebetween;
(d) lug means positioned between said first and second members; and
(e) means to radially shift said lug means by arcuately shifting said second member,
whereby said lug means may be shifted radially to clampingly engage and to disengage said shaft.

4,220,065

HAMBURGER BUNS AND METHOD OF PREPARING SAME

Arthur Stanford, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jun. 2, 1978, Ser. No. 911,855
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—873 **2 Claims**

1. A method of preparing a hamburger bun for packaging, comprising the steps of
conveying a single hamburger bun while preventing said bun from turning along a path between a pair of spaced rotating blades thereby providing cuts in the same plane on opposite sides of the bun by the blades for at least partially separating said bun into upper and lower bun portions while leaving a relatively thin shallow frangible web inside the bun extending substantially across the bun between the cuts thereby interconnecting the upper and lower bun portions for packaging and whereby said bun separates easily with the separated web being compara-

tively smooth and substantially contiguous with the surfaces of the cuts.

4,220,066

APPARATUS FOR CUTTING OR SCORING SHEET MATERIAL

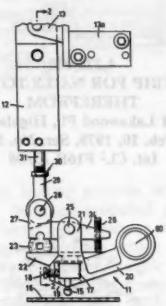
Brian Hargreaves, Warrington, and Angus D. Duncan, Ashton-in-Makerfield, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Filed Aug. 2, 1978, Ser. No. 930,069

Claims priority, application United Kingdom, Aug. 10, 1977, 33622/77

Int. Cl.³ B26D *3/08*

U.S. Cl. 83—886 **12 Claims**



1. Glass scoring apparatus comprising a cutter assembly for carrying a cutting tool, means connected to the cutter assembly for transmitting a cutting load to the cutter assembly, and a block of resilient material for absorbing part of any energy developed by reaction forces opposing the cutting load when the cutting tool is moved into contact with the glass surface, block of resilient material having a loss factor tan δ which is greater than 0.2 as determined by British Standard BS903; Part A24 1976 at a temperature of 23° C. and a frequency of 200 Hertz, so as to prevent a substantial transient reduction in the cutting load.

4,220,067

AUTOMATIC MUSICAL PERFORMANCE INSTRUMENT

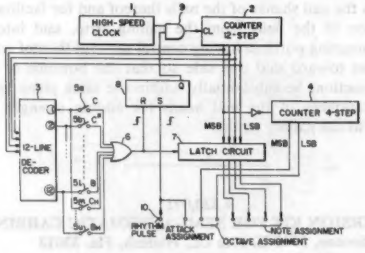
Toshio Mishima, Shobu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jan. 9, 1978, Ser. No. 867,925

Claims priority, application Japan, Jan. 25, 1977, 52-6939

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.03 **5 Claims**



1. An automatic musical performance instrument which successively outputs notes corresponding to depressed keys in synchronism with rhythm pulses from a rhythm generator to perform auto-arpeggio comprising:

a counter for counting a high-speed clock from a high-speed clock generator and producing a binary coded output count signal;

a depressed key detector for generating a scanning pulse in synchronism with the counter to detect a depressed key;

a key switch circuit for generating a depressed key signal with the scanning pulse from the depressed key detector;

control means for maintaining said counter operative in response to a rhythm pulse from a rhythm pulse generator and for maintaining said counter inoperative in response to the depressed key signal from the key switch circuit the rhythm pulse then causing a resumption of operation of the counter;

a latch circuit for storing a single binary coded signal from the counter representative of a single note in response to the depressed key signal from the key switch circuit; and

a tone signal converter for converting the binary coded signal from the latch circuit to a tone signal which is produced at the appropriate time in accordance with the rhythm pulse, whereby upon each application of the rhythm pulse the binary coded signal of the next depressed key signal is stored in the latch circuit and converted into a corresponding tone signal.

4,220,068

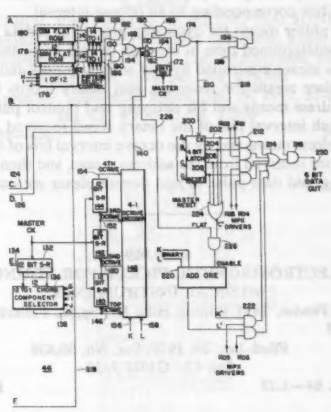
METHOD AND APPARATUS FOR RHYTHMIC NOTE PATTERN GENERATION IN ELECTRONIC ORGANS

Stephen L. Howell; Ralph N. Dietrich; John W. Robinson, all of Jasper, and James P. Osburn, Terre Haute, all of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Aug. 9, 1978, Ser. No. 932,226

Int. Cl.² G10F *1/00*; G10H *1/00*

U.S. Cl. 84—1.03 **24 Claims**



1. In an electronic organ including a solo manual, an accompaniment manual, and means for scanning at least one of said manuals to produce a multiplexed data stream comprising respective time slots corresponding to successive keys of the scanned manual wherein key down signals appear in respective time slots corresponding to notes of depressed keys of the scanned manual, rhythmic note pattern generation circuitry comprising:

chord encode means for producing an encoded chord signal in response to the depression of one or more keys in the accompaniment manual corresponding to a player selected chord, said chord signal containing data corresponding to the notes of the selected chord,

memory means for storing data representative of a plurality of rhythmic patterns of musical intervals,

address means for addressing said memory means to select one of said patterns and for providing at an interval output

musical interval signals corresponding to the musical intervals of the selected pattern, said musical interval signals being provided one at a time at a rhythmic rate much slower than the rate at which said one manual is scanned,

each of said musical interval signals being a multiple bit binary word wherein one group of bits in the word corresponds to a pitch interval and the remaining group of bits corresponds to an octave interval, and

data generating means corresponding to said encoded chord signal and to the musical interval signal at said interval output for producing a control pulse at a predetermined time in the scanning of said one manual and for delaying said control pulse by a number of successive time slots in said multiplexed data stream determined by the pitch interval bits of the musical interval signal at the interval output and by a number of octave length groups of time slots determined by the octave interval bits of the musical interval signal at the interval output.

9. In an electronic organ including tone generator means, transducer means, keyers connecting the generator means with the transducer means, playing keys, multiplexer means for scanning the keys sequentially, and demultiplexer means responsive to time division multiplexed binary data supplied thereto to actuate the keyers, rhythmic note pattern circuitry comprising:

memory means having a plurality of rhythmic note patterns stored therein,

address means for addressing said memory means to select one of said patterns and produce in succession a plurality of binary words at a rhythmic rate much slower than the rate at which the keys are scanned,

each of said binary words comprising one group of bits corresponding to a pitch interval and the remaining group of bits corresponding to an octave interval,

root pulser means for cyclically producing a data pulse at a predetermined time in the scan of said keys, and

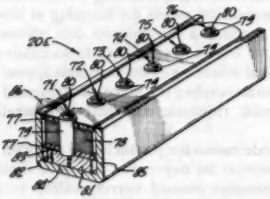
delay means controlled by said address means and said root pulser means for receiving said binary words from said address means and for delaying said control pulse by the pitch interval bits of the binary word received from said address means and by the octave interval bits of the binary word received from the address means, and then transmitting said data pulse to said demultiplexer means.

4,220,069

ELECTROMAGNETIC PICKUP FOR STRINGED MUSICAL INSTRUMENTS

C. Leo Fender, 2851 Rolling Hills Dr. Sp.33, Fullerton, Calif. 92635

Filed Jun. 20, 1979, Ser. No. 50,438
Int. Cl.³ G10H *3/18*
U.S. Cl. 84—1.15 **17 Claims**



1. A pickup assembly for an electrical musical instrument of the type including a plurality of strings which lie generally in a single plane comprising:

at least one metallic, unmagnetized pole piece operatively associated with said strings of said instrument, a first end of said pole piece being closely adjacent to said plane of said strings, a second opposite end of said pole piece being relatively remote from said plane of said strings;

a bar magnet having a first surface defining a north pole and an opposite second surface defining a south pole, said bar magnet being positioned with one of said surfaces thereof in surface contact with said second end of said pole piece; and

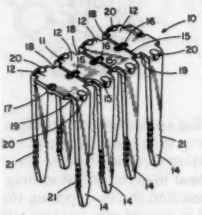
coil means wound around said pole piece.

4,220,070

NAILING STRIP FOR NAILS TO BE DRIVEN THEREFROM

Edgar P. Anstett, 21 Lakewood Pl., Highland Park, Ill. 60035

Filed Feb. 10, 1978, Ser. No. 876,746
Int. Cl.² F16B *15/08*
U.S. Cl. 85—49 **7 Claims**



1. A nailing strip for use in a nailing machine comprising an integral elongated stamped and formed sheet metal strip of nails including a plurality of substantially rectangular nail heads integrally interconnected along the length of the strip by integral interconnecting portions of reduced thickness at the transverse edges of the nail heads, and a pair of nail shanks integrally extending at substantially right angles from one side of each of the nail heads of the strip at the longitudinal edges of the nail heads, the integral interconnecting portions of the strip at the transverse edges of the nail heads form recesses on said one side by being swaged from said one side to increase substantially the width thereof and decrease substantially the thickness thereof for increasing the spacing along the strip between the nail shanks of the nails thereof and for facilitating separation of the nails from the nailing strip, said integral interconnecting portions having central sections thereof which are offset toward said one side so that the bottoms of said central sections lie substantially within the same plane as the bottom surfaces of the nail heads for adding strength and rigidity to the nailing strip.

4,220,071

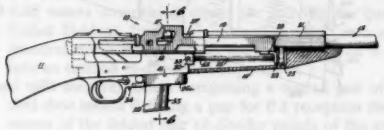
CONVERSION KIT FOR SEMI-AUTOMATIC CARBINES

Abe Seiderman, 3740 E. 10th Ct., Hialeah, Fla. 33013

Filed Apr. 17, 1978, Ser. No. 896,646
Int. Cl.³ F41D *7/03*
U.S. Cl. 89—128 **4 Claims**

1. In a modified to .22 caliber use United States Government Issue .30 caliber M1 or M1A1 semi-automatic carbine of the type having an original replaceable barrel, original receiver,

original replaceable bolt assembly and original replaceable slide assembly before its modification to .22 caliber use, the improvement comprising, a replacement barrel having a .22 caliber bore substituted for the original barrel, a replacement bolt assembly of lesser weight than that of the original bolt assembly and substituted for the original bolt assembly, said replacement barrel having a rearwardly-extending breech portion operative, when assembled to the original receiver, to limit the foreward movement of said replacement bolt assembly fitted in the original receiver, thereby preventing said replaced bolt assembly being rotatively cammed into the receiver bolt assembly locking grooves, whereby said carbine will be converted from gas-propelled piston operation in which the original barrel piston uncams or unlocks the bolt to direct blow-back recoil operation with a .22 caliber ammunition, and a replacement operating slide substituted for the original slide assembly, said replacement operating slide being of such reduced overall weight as compared with the combined weight of the original operating slide and bolt assemblies replaced as provides for semi-automatic, direct blow-back recoil operation of the substituted bolt and slide mechanism without substantial loss of firing power, said replacement operating slide being fabricated of stamped sheet metal.

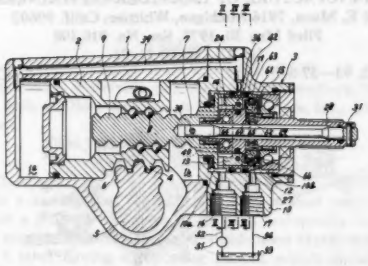


4,220,072

POWER STEERING APPARATUS

Akio Numazawa, Nagoya; Minoru Kawabata, Aichi; Ryutaro Abe, Toyokawa; Mikio Suzuki, Hekinan, and Yoshiharu Inaguma, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Aichi, Japan

Filed Aug. 15, 1978, Ser. No. 933,873
Claims priority, application Japan, Sep. 6, 1977, 52-119753[U]
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—375 A **9 Claims**



1. A power steering apparatus comprising:

a housing having a supply port for introducing pressure fluid into said power steering apparatus and a discharge port for discharging fluid therefrom;

a fluid pressure motor for supplementing manual steering torque;

a first rotatable steering rod member rotating in response to the action of said fluid pressure motor;

a manually rotatable second steering rod member aligned with said first steering rod member;

resilient means for resiliently connecting said first and second steering rod members to allow relative rotation therebetween;

a main valve member fixedly connected to said first steering rod member;

a sleeve valve member tightly receiving said main valve member and rotatably mounted in said housing;

flap valve means mounted on said second steering rod member within said main valve member and extending radially of said second steering rod member, said main valve member and said flap valve means being operable to control flow of fluid under pressure supplied into and discharged from said fluid pressure motor when relatively rotated by the manual steering torque;

plunger means slidably received in said flap valve means for a sliding movement in a direction radially of said second steering rod member;

an anti-vibration member made of synthetic resin and provided on said plunger means; and

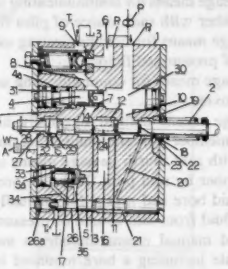
passage means communicating with said supply port for applying fluid under pressure to said plunger means to urge said anti-vibration member against said sleeve valve member.

4,220,073

CONTROL VALVE FOR WORKING MACHINES

Masao Ohashi, Hyogo, and Hirokatsu Sakamoto, Kobe, both of Japan, assignors to Iseki & Co., Ltd., Matsuyama, Japan

Filed Jul. 18, 1978, Ser. No. 925,858
Claims priority, application Japan, Jul. 19, 1977, 52-86978
Int. Cl.[2] F15B *11/08, 13/04*
U.S. Cl. 91—438 **3 Claims**



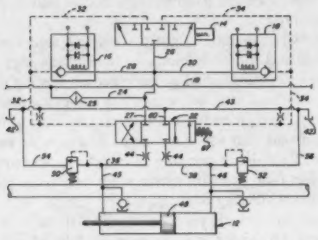
1. A control valve for a working machine comprising a change-over valve for connecting or shutting off a cylinder port to or from a pump port or tank port by the operation of a spool, and a compensator for guiding pressure in the cylinder port into an oil chamber on the spring loaded side of a plunger to by-pass the discharge oil from the pump against the pump pressure, characterized in that a passage is provided for connecting the oil chamber of the compensator on said spring loaded side into the tank port or cylinder port through said change-over valve, whereby when the change-over valve is at its neutral or descending position, said oil chamber is communicated into the tank port, and when said change-over valve is at its ascending position, said oil chamber is communicated into the cylinder port.

4,220,074

SWITCHING VALVE

Raymond G. Reip, Clarendon Hills, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed May 25, 1977, Ser. No. 800,293
Int. Cl.[3] F15B *13/043;* F16K *25/00;* B32B *27/06*
U.S. Cl. 91—453 14 Claims



1. A pilot operated switching valve operable by at least one source of low pressure pilot fluid for controlling the flow of actuation fluid from a source of high pressurized fluid to a hydraulic prime mover comprising:

a valve body;

a bore defined in said body;

a fluid flow control member of a constant diameter including a low friction outer periphery that is plastic infused metal plated to allow said control member to be slideably mounted in said bore, said member having first and second ends defining first and second pressure surfaces adapted to interact with said pilot fluid to develop a force to slide said member in said bore;

first passage means for communicating said first end of said member with said source of pilot fluid;

second passage means for communicating said second end of said member with said source of pilot fluid;

third passage means for communicating said bore with said source of pressurized fluid;

fourth passage means for communicating said bore with said prime mover;

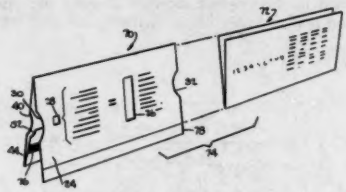
fifth passage means defined internally in said fluid flow control member for communicating said third passage means with said fourth passage means upon actuation of said member by said pilot fluid to a preselected position within said bore and means for manually controlling the flow of fluid from said source of pressurized fluid to said bore, said manual means includes a manually operated valve plate including a bore mounted in said body, and sixth passage means for communicating said manually operated valve plate with said source of pressurized fluid, said manual means further includes seventh passage means for communicating said manually operated valve with said first passage means, and eighth passage means for communicating said manually operated valve with said second passage means, said manual valve further including at least one ball valve element and a valve element selector means for selectively moving said ball valve element out of one of said seventh and eighth passage means for allowing fluid flow therethrough, said manual valve further comprising a ball detent member including means resiliently mounting said member in said manual valve and engaging said plate for automatically returning said valve element selector means to a position out of engagement with said valve element upon release thereof.

4,220,075

METHOD OF MAKING A SLIDE CALCULATOR

Howard M. Bromberg, Bronx, N.Y., assignor to The Flexi-Group, Inc., New York, N.Y.

Division of Ser. No. 701,082, Jun. 30, 1976, Pat. No. 4,132,348.
This application Sep. 21, 1978, Ser. No. 944,231
Int. Cl.[2] B65D *27/04*
U.S. Cl. 93—1 F 8 Claims



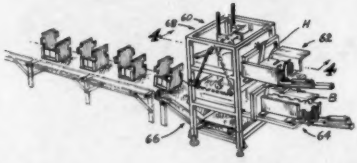
1. A method of making a slide calculator comprising, dividing a foldable sheet member of predetermined size into at least two contiguous, generally rectangular leaf members, forming a line of separation on the sheet member to render the leaf members detachable from one another, providing one of the leaf members with at least two folding lines parallel to the line of separation to divide the one leaf member into three sleeve segments, with the spacing between the fold lines in the sleeve member being selected to provide at least two contiguous sleeve segments with substantially equal width, providing the other leaf member with at least one folding line parallel to the line of separation to divide the other leaf member into two slide segments, providing data portions on at least one of said sleeve segments and one of said slide segments, providing means on said one of said sleeve segments to permit correlation of the data portion on said one of said sleeve segments with the data portion on said one of said slide segments, detaching the one leaf member from the other leaf member at the line of separation, folding the one leaf member along its fold lines such that the sleeve segments overlap to form a sleeve component, folding the other leaf member along its fold line such that the slide segments overlap to form a slide component, the respective predetermined sizes of the leaf members and the spacing between the fold lines on each leaf member being selected to permit slidable accommodation of the folded slide component in the folded sleeve component, and assembling the slide component in the sleeve component to permit correlation of the data portion on said one of said sleeve segments with the data portion on said one of said slide segments.

4,220,076

MANUFACTURE OF H-DIVIDER CONTAINERS

Lenard E. Moen, 7914 Michigan, Whittier, Calif. 90602

Filed May 30, 1978, Ser. No. 910,198
Int. Cl.[2] B31B *11/26*
U.S. Cl. 93—37 SP 55 Claims



1. A machine for forming a paperboard or the like container from a preformed flat H-divider blank and a preformed flat body blank,

the flat H-blank having two divider panels joined along a

transverse hinge line and each of the divider panels being transversely flanked by an integral pair of foldable end panels,

the flat body blank having a substantially rectangular bottom panel joined, along a longitudinally spaced apart pair of parallel transverse fold lines, to an opposite pair of substantially rectangular side panels, each of the bottom and side panels having a transversely opposite pair of foldable marginal flaps,

said machine comprising:

H-blank infeed means to fold the end panels of the flat H-blank substantially 90° relative to the divider panels, while maintaining the divider panels in co-planar flat condition, during movement of the H-blank to an indexed position in said machine;

H-fold means comprising means for moving the partially folded H-blank from said indexed position into a split mandrel means while erecting the partially folded H-blank into an erected H-divider configuration;

said split mandrel means comprising a spaced pair of mandrel shoe means defining a gap for the reception therebetween of the folded pair of divider panels of the erected H-divider, said mandrel means also defining surfaces for pressing thereagainst of each of the end panels of the erected H-divider;

body blank fold and die plate means comprising a laterally spaced apart pair of body blank support means on the opposite side of said mandrel means from said H-fold means,

said pair of body blank support means being movable inwardly and outwardly relative to one another between intermediate and compression positions thereof and also being comovable towards and away from said mandrel means between, respectively, folded and flat conditions thereof;

said body blank support means in said flat condition and in said intermediate position being adapted to support a flat body blank in an indexed position relative to an erected H-divider in said mandrel means,

said pair of body blank support means each having articulated elements adapted to translate movement of said support means towards said mandrel means into substantially 90° folding of the side panels of the body blank thereon relative to the bottom panel and around said mandrel means;

said articulated elements also being adapted to effect partial inward folding of the marginal flaps of the body blank against corresponding edges of the end panels of the erected H-divider;

said articulated elements also serving to fully fold the marginal flaps of the body blank onto corresponding edge portions of the end panels of the erected H-divider as a function of movement of said pair of body blank support means inwardly from said intermediate positions to said compression positions thereof.

4,220,077

COMPOSITE CAN REGISTRATION

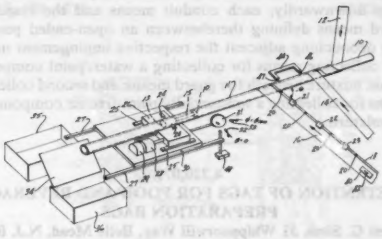
Peter S. Miller, Waterville, and Jerry D. Schermerhorn, Swanton, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 22, 1978, Ser. No. 889,158
Int. Cl.[2] B31C *3/00*
U.S. Cl. 93—80 **29 Claims**

1. In a method for producing spirally wound containers wherein a plurality of layers of material are spirally wound onto a mandrel to form a tube, the outside layer of said material being a label having a repeating pattern which includes a plurality of generally equally spaced apart reference marks located along its length, wherein sections of said tube are severed in register with said pattern by cutting means connected to a reciprocating carriage which moves parallel to the longitudinal axis of said tube, and wherein registration is controlled by maintaining the long term phase relationship between the motion of the carriage and the sensing of the passage of said reference marks past a reference point, an improved method wherein said cutting means are carried by a movable sled connected to said carriage and movable parallel to the longitudinal axis of said tube comprising the steps of:

generating a residual registration error signal;

generating a position change signal which is a function of said residual registration error signal,



positioning said sled relative to said carriage before cutting, in response to said position change signal so as to minimize registration error with respect to said repeating pattern

determining the registration error remaining at the time cutting occurs;

comparing said remaining registration error with preset limits; and

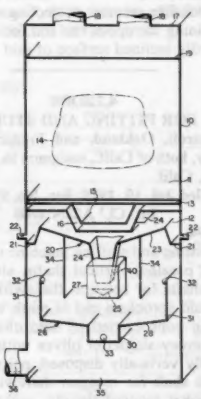
rejecting the section of tube which was cut off if said remaining registration error exceeds said preset limits.

4,220,078

PAINT-SPRAYING BOOTH APPARATUS

Reginald J. Walker, Solihull, and David T. Geen, Hockley Heath, both of England, assignors to Otto Durr (Great Britain) Limited, Leamington Spa, England

Filed Mar. 1, 1978, Ser. No. 882,440
Claims priority, application United Kingdom, Mar. 2, 1977, 8799/77; Fed. Rep. of Germany, Oct. 18, 1977, 2746738
Int. Cl.[3] B01D *47/00*
U.S. Cl. 98—115 SB **8 Claims**



1. A paint-spraying booth apparatus including: a floor on which, in operation, objects to be spray painted pass, said floor being permeable to air; reservoir means beneath the floor for containing water; a plurality of conduits which converge from inlet to outlet and which extend downwardly from the reservoir means, the reservoir means and the conduits being ar-

ranged so that paint-containing air passing through the floor mixes with water from the reservoir means, the resulting mixture passing through the conduit means; impingement means spaced from the outlet of each conduit and disposed so that said mixture flowing through the conduit impinges thereon to perform a first scrubbing action; tubular guard means externally surrounding each conduit and the respective impingement means, to urge said mixture, after contact with the impingment means, (a) to impinge on the respective guard means to perform a second scrubbing action and (b) to travel substantially downwardly, each conduit means and the respective guard means defining therebetween an open-ended passageway debouching adjacent the respective impingement means; first collecting means for collecting a water/paint component of said mixture beneath the guard means; and second collecting means for collecting a substantially paint-free air component of the mixture.

4,220,079

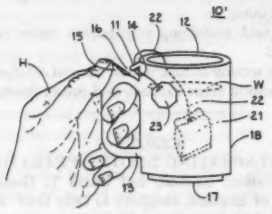
RETENTION OF TAGS FOR FOOD AND BEVERAGE PREPARATION BAGS

Ernest G. Sims, 31 Whippoorwill Way, Belle Mead, N.J. 08502

Continuation-in-part of Ser. No. 957,760, Nov. 6, 1978, abandoned. This application Dec. 21, 1978, Ser. No. 972,044

Int. Cl.[2] **A47G** *19/22, 19/20;* **A47J** *31/00*

U.S. Cl. 99—295 **10 Claims**



1. A tag retention container, comprising

a bowl having a base, an upper outer rim, and an affixed handle;

said handle having an upwardly and outwardly inclined upper surface; and

a separate hook-like member projecting outwardly from said bowl adjoining the upper rim and facing and spaced from the upwardly inclined surface of said handle.

4,220,080

MACHINE FOR PITTING AND STUFFING OLIVES

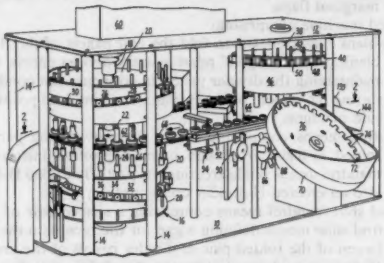
John L. Margaroli, Oakland, and Frederick J. Cimperman, Castro Valley, both of Calif., assignors to Vistan Corporation, San Leandro, Calif.

Filed Jul. 10, 1978, Ser. No. 923,376

Int. Cl.[3] **A23N** *4/08*

U.S. Cl. 99—494 **5 Claims**

1. An olive pitting and stuffing machine comprising first and second spaced, parallel, vertical shafts, aligned sprockets secured to said shafts for rotation therewith, an endless chain trained about said sprockets and in mesh with said sprockets, olive conveying cups carried by said chain and adapted to support and convey singleton olives with their longitudinal axes substantially vertically disposed, pairs of plate members secured to each shaft for rotation therewith both above and below the sprocket secured thereto, said plate members extending into overlying and underlying relation with said cups, opposed sets of olive pitting and coring knives carried for movement toward and away from each other by the plate members secured to said first shaft, first stationary means disposed outwardly of the plate members secured to said first shaft to move said pitting and coring knives toward each other into engagement with the pits of olives in said cups, thereafter together in the same direction to remove the pits of said olives, and thereafter apart and out of engagement with said olives, holding means carried by said second shaft for positioning stuffing pieces in alignment with said cups, opposed olive hold-down means and stuffing piece ejection rod means carried for movement toward and away from each other by the plate members secured to said second shaft, and second stationary



means disposed outwardly of the plate members secured to said second shaft to move said hold-down means into engagement with olives in said cups, thereafter to move said ejection means to transfer stuffing pieces from said holding means into said olives, and thereafter to move said hold-down means away from said olives, and continuous drive means for one of said shafts operable through said sprockets and endless chain to also continuously drive the other of said shafts.

4,220,081

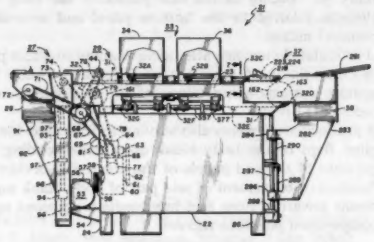
SHEET FEEDING, REGISTERING AND PRINTING APPARATUS

Warren S. Hawkinson, St. Paul, Minn., assignor to Deluxe Check Printers, Inc., St. Paul, Minn.

Filed Feb. 8, 1978, Ser. No. 876,059

Int. Cl.[3] **B41F** *1/28;* **B41J** *13/08, 13/28*

U.S. Cl. 101—93.11 **24 Claims**



1. In a sheet feeding, registering and printing apparatus comprising a bed and platen printing unit with radidly and selectively adjustable printing elements within a defined printing position for printing selected characters on a desired printing area of a sheet having a leading edge and lateral side edge portions, when the printing area of such sheet is positioned close to such printing elements in such printing position, and means for feeding such a sheet longitudinally to and through the printing position with the printing area positioned close to and in desired registration with respect to the printing elements of the printing unit, the improved combination in which the feeding means comprises a feed band for feeding successive sheets from a registration position to and beyond the printing position, said feed band having at least one gripper device secured thereon for positive gripping and driving engagement with a lateral edge portion of each unit sheet, means guiding the band and gripper device for longitudinal movement along an axis spaced laterally from the printing elements at the print-

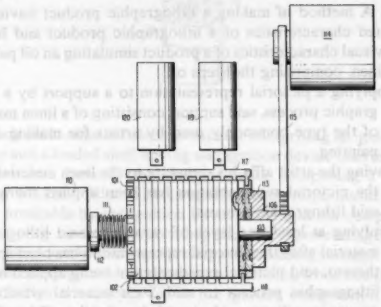
ing position, intermittent driving means for positively driving the feed band and sheet in equal incremental movements from the registration position to and beyond the printing position, initial sheet supply mechanism for feeding successive separate individual sheets to the feed band and gripper device, and registration means for sequentially positioning a lateral edge of such sheet in accurate longitudinal and lateral registration with the feed band and gripper device at the registration position.

4,220,082

PRINT WHEEL SELECTION MECHANISM

Richard A. Edwards, Alameda, Calif., assignor to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed May 3, 1979, Ser. No. 35,636
Int. Cl.³ B41J *1/44*
U.S. Cl. 101—93.22 **5 Claims**



1. A print wheel selection mechanism comprising:

a plurality of print wheels and a like plurality of intermediate stop wheels interdigitally and rotatably mounted on a common shaft and means for urging each of said plurality of print wheels and said plurality of intermediate stop wheels to rotate in a predetermined direction, said print wheels and said intermediate stop wheels being provided with stop means for limiting the rotation of the next succeeding wheel,

encoder means foe sequentially setting the angular positions of each of said plurality of print wheels, said encoder means including an encoder stop means adjacent a first one of said intermediate stop wheels for limiting the rotation of said first one of said intermediate stop wheels,

first locking means for releasably engaging said plurality of intermediate stop wheels to prevent their rotation, said first locking means releasing said plurality of intermediate stop wheels after each sequential setting by said encoder means and re-engaging said plurality of intermediate stop wheels after said first one of said one intermediate stop wheels has rotated to engage said encoder stop means and each of the remainder of said plurality of intermediate stop wheels has rotated to engage the stop means of the next preceding print wheel,. and

second locking means for releasably engaging said plurality of print wheels to prevent their rotation, said second locking means releasing said plurality of print wheels after each re-engagement of said plurality of intermediate stop wheels by said first locking means and re-engaging said plurality of print wheels after each of said plurality of print wheels has rotated to engage the stop means of the next preceding intermediate stop wheel,

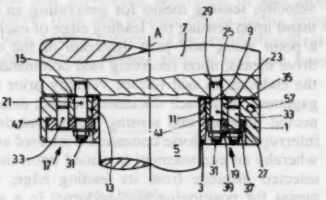
whereby each angular position of said plurality of print wheels is sequentially set by said encoder means and shifted from print wheel to print wheel via said intermediate stop wheels until the angular positions of all of said print wheels have been set.

4,220,083

BEARER RING-PRESS CYLINDER CONNECTION CONSTRUCTION FOR ROTARY PRINTING MACHINE

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,394
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753296
Int. Cl.³ B41F *5/00*
U.S. Cl. 101—216 **10 Claims**



1. In a rotary printing press,

a bearer ring (1) - press cylinder (7) connection construction, in which the bearer ring (1) is mounted on the shaft (5) of the cylinder for rotation therewith and positioned against an end face of the cylinder, the shaft passing through the bearer ring,

and wherein, in accordance with the invention,

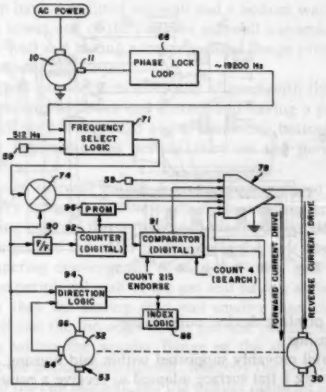
the engagement surfaces (9, 11) of the shaft and of the bearer ring are axially bowed or rounded to form, respectively, matching concave-convex engagement surfaces to permit slight floating alignment of the bearer ring with respect to the axis of rotation of the respective printing cylinder and tilting of the plane of rotation of the bearer ring with respect to the direction of the axis of rotation of the shaft in the region of said engagement surfaces.

4,220,084

DOCUMENT ENDORSER APPARATUS

George Maclean; Eddy J. Milanes, and Harold W. Pexton, all of Oklahoma City, Okla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Nov. 7, 1978, Ser. No. 958,478
Int. Cl.³ B41F *13/24*
U.S. Cl. 101—235 **12 Claims**



1. Document endorsing apparatus including:

transport means for conveying documents in series along a path; first signaling means for generating a transport signal

having a frequency varying linearly with a transport velocity of said documents; an endorser positioned for surface engagement with each of said documents as it is so conveyed; drive means for rotating said endorser; second signaling means for generating an endorser signal having a frequency varying linearly with a rotational surface velocity of said endorser; a phase/frequency comparator for generating, as an input to said drive means, a control signal response to the difference in frequency between said endorser and transport signals whereby said drive means, responsive to said control signal, varies said surface velocity toward equalization with said transport velocity; sensing means for generating an endorse command upon sensing the leading edge of each document at a point along said path upstream of the endorser, said drive means, upon receiving said command, accelerating the endorser to said surface velocity prior to surface engagement with each document sensed; delay means connected between said sensing means and drive means to interrupt said endorse command a selected amount of time whereby an endorsement is placed upon the document a selected distance from its leading edge; an alignment means for positioning said endorser in a select angular position before said drive means receives said endorse command, said alignment means including a transparent disc mounted for rotation with said endorser, a light source and an index photosensor on opposite sides of the disc, and an opaque index mark on the disc adapted to prevent light transmission from the source to said index photosensor to define peripherally a dark angular region and a light angular region wherein light transmission is permitted; and search means for actuating said drive means whereby the endorser is rotated at a search velocity substantially less than said surface velocity, said search means disabled to stop the endorser responsive to a transition from one of said angular regions to the other.

4,220,085

LOW-NOISE PRINTING DEVICE

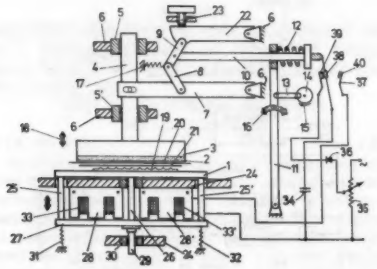
Helmut A. M. Schottle, Berlin, and Helmut Müller, Hilchenbach-Oberndorf, both of Fed. Rep. of Germany, assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 635,392, Nov. 26, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,589

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1974, 2457114

Int. Cl.[3] B41F *1/06*

U.S. Cl. 101—316 **9 Claims**



1. A printing device, comprising:

a housing;

an anvil movably supported within said housing, said anvil having a flat surface adapted to receive a printing plate;

a printing pad having a flat surface located opposite the flat surface of said anvil;

mechanical means for driving said printing pad from a first position to a second position, said printing pad being directly before and spaced from said anvil when in said second position;

electromagnetic drive means operative to drive said anvil into printing engagement with said printing pad after said mechanical means has driven said printing pad to said second position; and

means for enabling said electromagnetic drive means.

4,220,086

LITHOGRAPHIC PRINTING PROCESS

Jean M. Laleta-Ballini, Paris, France, assignor to Idegraf, Geneva, Switzerland

Continuation of Ser. No. 762,878, Jan. 27, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,198

Int. Cl.[3] B41M *1/06;* **B05D** *1/36*

U.S. Cl. 101—450.1 **3 Claims**

1. A method of making a lithographic product having the printed characteristics of a lithographic product and having the visual characteristics of a product simulating an oil painting on linen, comprising the steps of:

applying a pictorial representation to a support by a lithographic process, said support consisting of a linen material of the type commonly used by artists for making an oil painting,

having the artist affix his signature to the linen material after the pictorial representation has been applied thereto by said lithographic process,

applying at least one layer of varnish to said lithographic material after the pictorial representation has been applied thereto, said pictorial representation being applied by the lithographic process to said linen material which is a canvas-type linen, said varnish having the effect of protecting the pictorial representation from the harmful effect of the sun's rays and making the pictorial representation glisten, and

affixing the linen material having the pictorial representation applied thereto to a carrier to stretch the linen material in the same manner as an oil painting.

4,220,087

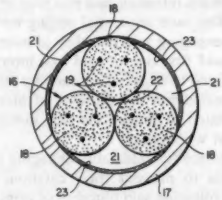
LINEAR IGNITION FUSE

Philip L. Posson, Suisun, Calif., assignor to Explosive Technology, Inc., Fairfield, Calif.

Filed Nov. 20, 1978, Ser. No. 962,180

Int. Cl.[2] C06C *5/00;* **F42B** *3/10*

U.S. Cl. 102—27 R **13 Claims**



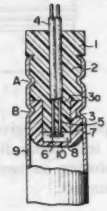
1. In an ignition fuse: an elongated core of ignitive, nondetonative material comprising a mixture of particulate fuel having a high heat of combusion and an oxidant, an imperforate frangible sheath encasing the core, and a longitudinally extending gas channel adjacent to the ignitive material of the core for supporting an ignitive reaction which travels along the fuse at a supersonic rate, shattering the sheath and spewing incandescent reaction products from the fuse in a generally radial direction.

4,220,088

STATIC-RESISTANT ELECTRIC INITIATOR

Michio Kimura; Nobuyuki Izawa, and Nobuaki Sakuma, all of Nobeokashi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 20, 1978, Ser. No. 917,164
Claims priority, application Japan, Jul. 4, 1977, 52-79059; Jul. 4, 1977, 52-87555[U]; Dec. 9, 1977, 52-164430[U]
Int. Cl.[3] F42B 3/10; C06C 3/00
U.S. Cl. 102—28 R 10 Claims



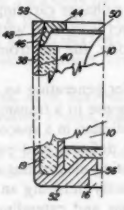
1. In a static-resistant electric initiator comprising an ignition device and a loaded shell having said ignition device inserted in an open end thereof; said ignition device comprising a cup having a bottom filled with an ignition composition, said cup being breakable by the ignition flame of the ignition composition, a plug having a protruding part, said protruding part being fitted within said cup, two leg wires passing through said plug and having bared terminal parts extending from said plug, and a bridge wire embedded in the ignition composition and connected to said bared terminal parts, the improvement wherein said cup is made of one member selected from the group consisting of an ethylene-vinyl acetate copolymer and an ethylenic ionomer, and at least one crimp is formed in said loaded shell and said cup at a position corresponding to that portion of said cup where said plug is fitted into said cup.

4,220,089

CARTRIDGE FOR A FULLY TELESCOPED PROJECTILE

William G. Smith, Burns, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,447
Int. Cl.[3] F42B 5/02
U.S. Cl. 102—38 R 6 Claims



1. A cartridge which comprises:

a fully telescoped and environmentally protected projectile;

tubular housing means for operatively holding said telescoped projectile therein which includes a convergently tapered open front end interior wall and a partially closed rear end, said rear end having an axially disposed primer bore therein, said convergently tapered open front end has an exterior straight sided wall coverted from a divergently tapered wall having a divergent angle θ;

propellant means operatively disposed in said housing means for forcibly ejecting said projectile from said housing means;

primer means fixedly positioned in said primer bore for initiating said propellant means;

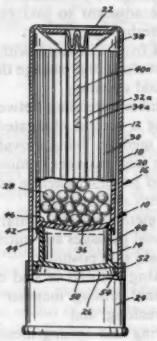
seal member means comprising an annular shaped element having a convergently tapered peripheral side and an environmental forward closure member, disposed in said convergently tapered open front end of said housing means and interfacing therewith in an annular seal, for retaining said projectile in a fully telescoped position within said housing means and environmentally protecting said projectile prior to activation of said primer means, said annular seal preventing separation of said annular shaped element from said housing means during firing of said cartridge, and for preventing escape of propellant gas between said annular shaped element and said housing means.

4,220,090

SHOT WAD COLUMN

David G. Fackler, 16230 Fifth Ave. North, Minneapolis, Minn. 55391

Filed Sep. 5, 1978, Ser. No. 939,451
Int. Cl.[3] F42B 7/08
U.S. Cl. 102—42 C 8 Claims



1. A shot wad column, comprising

a shot cup having a slitted sidewall and a bottom wall closing the lower end of the cup, the sidewall traversing the bottom wall and having a lower annular flange extending downwardly therefrom,

a cup-shaped gas seal concentrically aligned with the shot cup adjacent the lower end thereof and having a peripheral wall with a top edge and a transverse bottom wall with a depending gas sealing skirt on the periphery thereof,

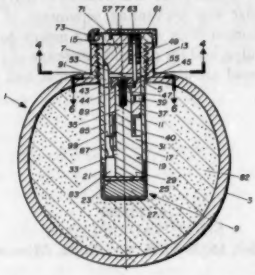
the shot cup sidewall having a longitudinally fluted outer periphery defining continuously open venting grooves extending entirely through the full length of the sidewall and flange, and the outer periphery of the shot cup sidewall tapering convergently toward the lower end of the cup, the peripheral wall of the gas seal having a diameter smaller than the sealing skirt and smaller than the cup sidewall and the top edge of the gas seal peripheral wall nesting within the annular flange of the shot cup and against the bottom wall thereof, whereby the grooves and taper of the cup sidewall and the smaller diameter and the nesting of the gas seal peripheral wall into the lower end of the cup contribute in cooperation with each other to provide continuous venting for the escape of excessive pressures behind the gas seal.

4,220,091

DELAY FUZE FOR EXPLOSIVE CHARGE

Sylvan H. Israels, Morris Plains, and Stephan Kosonocky, Whippany, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 3, 1978, Ser. No. 883,023
Int. Cl.[2] F42B 15/02, 15/36
U.S. Cl. 102—64 5 Claims



1. A delay fuze comprising:
an explosive charge to be initiated;
a barrier plate adjacent to said charge, having an access opening therethrough;
a body spaced from and fixed with respect to said barrier, having a first elongated passage therethrough out of alignment with said opening;
an arming member extending between said barrier and said body, having a second elongated passage therethrough; said arming member being movable between a safe position wherein said passages communicate with each other and an armed position wherein said second passage communicates with said opening;
an elongated metal encased unitary combustible element disposed in said passages and initially holding said arming member in said safe position;
means for igniting the end of said combustible element remote from said arming member to start a delay firing reaction therealong; and
means for moving said arming member to said armed position when said member is released by the burning of said combustible element and melting of the metal case thereof at the junction of said passages, to effect communication between said element and said opening.

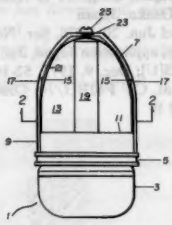
4,220,092

LEAF-SPRING COLOR-DISSEMINATING PROJECTILE FOR TRAINING CARTRIDGE

Robert C. Smith, Succasunna, and John H. Webb, Hopatcong, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 22, 1978, Ser. No. 935,838
Int. Cl.[3] F42B 11/18
U.S. Cl. 102—92.7 4 Claims

1. A color-disseminating projectile for a training cartridge, consisting essentially of:
a generally cylindrical base member;
a cup-shaped ogive member of frangible material, closed at one end and open at the other end, having its open end attached to the front end of said base member to form a cavity therebetween, said ogive member having an annular groove intermediate its ends forming an annular weak region therein;
a mass of finely-divided color-producing material substantially filling said cavity; and
a plurality of leaf spring resiliently interposed between said ogive member and the front end of said base member and substantially conforming to the interior wall of said cup shaped ogive member, for disseminating said color-producing material;



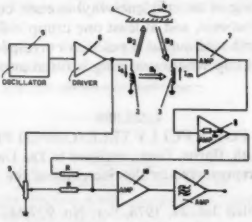
whereby, on target impact, said ogive member breaks at said weak region, and said leaf spring disseminates said material into the air, thus producing an easily-visible aerosol color signal in the region of impact.

4,220,093

ELECTROMAGNETIC PROXIMITY FUZE

Ake Nilsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 24, 1978, Ser. No. 909,237
Claims priority, application Sweden, May 26, 1977, 7706158
Int. Cl.[3] F42C 13/08
U.S. Cl. 102—212 9 Claims



1. An electromagnetic proximity fuze for initiating the detonation of a charge in a charge carrying body when an electrically conducting object is located within a particular triggering distance of the body, the electromagnetic proximity fuze comprising:
transmitter means for generating an alternating electromagnetic field in response to a transmitter signal;
receiver means positioned in a spaced relation to said transmitter means for defining said particular triggering distance, the alternating electromagnetic field of said transmitter means directly inducing an electromotive force in the receiver means and extending to interact with said electrically conducting object to cause said object to generate an electromagnetic interference field, the electromagnetic interference field inducting an interference electromotive force in said receiver means, said interference electromotive force and said directly induced electromotive force producing a receiver signal;
signal processing means for separating the interference electromotive force associated with said electrically conducting object from the directly induced electromotive force and emitting an ignition signal for initiating the detonation of said charge in response to the separated interference electromotive force.

4,220,094

CONVEYOR SYSTEMS

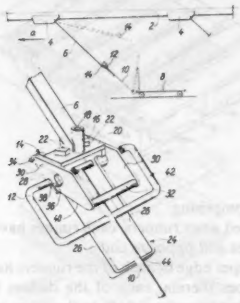
Jacob A. Nielsen, Viby, Denmark, assignor to Kosan Crisplant A/S, Denmark

Filed Apr. 11, 1978, Ser. No. 895,434

Claims priority, application United Kingdom, Apr. 12, 1977, 15061/77

Int. Cl.[2] B61B 3/00

U.S. Cl. 104—89 11 Claims



1. A conveyor system comprising a a plurality of wheel supported conveyor carts each having a pulling and steering rod, an overhead traction system for moving said conveyor carts, said traction system including rail means and traction members moving along said rail means, each of said traction members being provided with a depending tie rod, and a coupling means for releasably coupling an outer or upper end of the pulling and steering rod of any respective conveyor cart to an end of the tie rod, characterized in that the coupling means are constructed as interacting coupling means adapted to couple generally overlapping lengths of the tie rod and pulling rod together, the interacting coupling means being located adjacent the ends of the tie rod and pulling rod, means are provided on one of the tie rod and pulling rod for enabling limited relative rotation between the rods about the coupling means, that abutment means are provided on one of the tie rod and pulling rod for limiting the relative rotation of the two rods about said coupling means and in that said abutment means and said coupling means are disposed adjacent opposite ends of the overlapping length of the tie rod and pulling rod.

4,220,095

OVERHEAD CABLE TRANSPORT INSTALLATION WITH A DEVICE FOR MONITORING THE COMPONENTS SUPPORTING THE CABLE

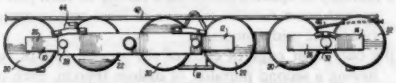
Andre J. Segafredo, Seyssinet-Pariset, France, assignor to S.A. Pomagalski, France

Filed Apr. 18, 1978, Ser. No. 897,270

Claims priority, application France, Apr. 22, 1977, 77 14159; Feb. 1, 1978, 78 03304

Int. Cl.[3] B61B 12/06

U.S. Cl. 104—179 4 Claims



1. A transport installation having an overhead cable and a device for monitoring the components supporting the cable, comprising:

a train of successive rockers, each rocker having two cable support sheaves and a spindle on which it is articulated,

a safety device to detect derailment of the cable or excessive movement of the rocker on the said spindle, said safety device having an electric line running along the installation and means for signalling an interruption of the electric line, wherein said electric line comprises a conductor wire inserted electrically in series in said line and running over the length of said train of rockers, and a plurality of sectioning shears each having two shanks pivoted together and working in conjunction with said conductor wire associated with each of the successive rockers of the said train, one of said shanks being fixed to the associated rocker and the other of said shanks being mechanically supported by said conductor wire, such that relative rotative movement between said shanks to actuate the shear and to section the conductor wire occurs in case of an excessive movement of the rocker, thereby to interrupt the safety line.

4,220,096

BOGIE

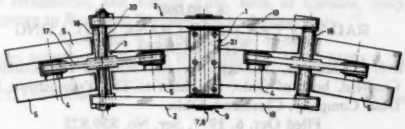
Alexandre Horowitz, Eindhoven, Netherlands, assignor to Varitrac AG, Zug, Switzerland

Filed Feb. 21, 1978, Ser. No. 879,829

Claims priority, application Netherlands, Oct. 21, 1977, 7701814

Int. Cl.[2] B61F 5/00, 3/02

U.S. Cl. 105—163 R 17 Claims



1. In a bogie for supporting and guiding a heavy load movable on rails, such as a crane, which bogie includes a number of wheels cooperating in pairs and which are mounted in a wheel frame, and a load supporting foot, and at least one further frame including at least a main frame, for supporting the load in uniformly divided fashion on said wheel frames, the improvement comprising means for transmitting the load through the supporting foot to the main frame and from there to the wheel frames, said transmitting means including a pair of cylindric surfaces of different radius of curvature engaging in line contact, such that the first cylindric surface supports the second cylindric surface, one of said pair of cylindric surfaces being on said main frame, the other of said cylindric surfaces being on the adjacent one of a series of members in load transmitting engagement between said load and wheels, said series of members including said foot, main frame, and wheel frames.

4,220,097

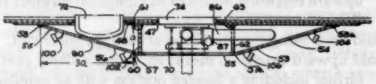
CONTINUOUS CRADLE PAD AND SKID FOR RAILWAY CARS

Richard J. Wempe, and Paul J. Dumser, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed May 12, 1978, Ser. No. 905,499

Int. Cl.[3] B61D 5/00

U.S. Cl. 105—360 18 Claims



1. A railway tank car skid arrangement comprising: a continuous cradle pad located below a tank extending longitudinally of the car; said cradle pad extending below substantially the

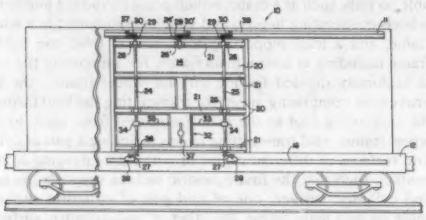
entire length of the tank between stub sills located at opposite ends of the car; said cradle pad being curved in the transverse direction to follow the tank bottom contour; a reinforcing portion integral with said cradle pad extending transversely on either side of the longitudinal center line of the tank and extending longitudinally outwardly from at least one tank car bottom fitting extending below the outer surface of the tank bottom; said reinforcing portion being curved in the transverse direction to follow the contour of the cradle pad; a tank car skid extending longitudinally and transversely of said bottom fitting rigidly attached to said reinforcing portion; said skid extending longitudinally of the tank at least three (3) inches on each side of the bottom fitting for each one (1) inch that said bottom fitting extends below the outer surface of the tank bottom; said skid being composed of opposite end portions rigidly connected to said reinforcing portion which end portions are inclined inwardly and downwardly toward each other, a skid center portion joining said skid end portions; and skid support means connected between said skid and said reinforcing portion to reinforce said skid.

4,220,098

RAILWAY CAR DOOR CRANK ACTUATING MECHANISM

Oliver J. Jenkins, Youngstown, and William D. Mundinger, Canfield, both of Ohio, assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Oct. 6, 1977, Ser. No. 839,825
Int. Cl.[2] B60J *5/08;* **B61D** *19/00;* **E05D** *15/10*
U.S. Cl. 105—378 **8 Claims**



1. In a rail house car having at least one opening along each of its sides,

a door for closing each of said openings by movement along said car sides and laterally into and out of said openings,

bottom and top rotating crank members moveably supporting and retaining said doors adjacent the lower portions of said doors on longitudinal track means and adjacent the upper portions of said doors within longitudinal retainer means,

means to rotationally drive at least some of said crank members for selective lateral movement of said doors,

the improvement comprising:

said top crank members adjacent the upper portion of said doors each including a bore having received therein an upward extension means of an elongated member rotationally mounted on said door,

said bore being counterbored at its uppermost end,

said upward extension means including a shank portion and further including a flanged portion with an annular flange dimensioned and located such that it is within the counterbore of said bore,

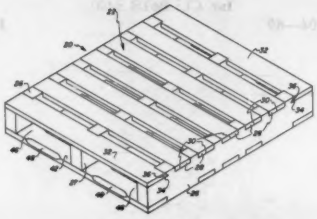
said shank portion being welded to said crank member, and said flanged portion being welded to said crank member.

4,220,099

PALLET

Anthony J. Marchesano, 15 Oak St., Lincroft, N.J. 07738

Filed Jul. 30, 1976, Ser. No. 710,558
Int. Cl.[3] B65D *19/26*
U.S. Cl. 108—51.1 **6 Claims**



1. A pallet comprising:

a pair of spaced apart runners, each runner having upper and lower edges and opposite ends;

at least the upper edge of each of the runners having a plurality of dadoes therein, each of the dadoes in one of the runners being opposite a dado in the other of the runners;

a plurality of deck boards stretching between the runners, each deck board having a top surface and a bottom surface;

each of the plurality of deck boards engaging a dado in each runner such that the top surfaces of the deck boards and the corresponding upper edges of the runners are at the same level to form the top of the pallet;

the plurality of deck boards including an outermost deck board at each of two opposite ends of the runners, the outermost edge of each outermost deck board being essentially flush with the corresponding ends of the runners so that the ends of the runners do not project beyond the top of the pallet;

at least a portion of the innermost edge of each of the two outermost deck boards being thinner than the full thickness of said deck boards;

the runner adjacent to said thinner portion being undercut beneath the upper edge of the runner complementary to the thinner portion to receive the deck board in intimate contact therewith;

the thinner portion of each deck board having a configuration which drops off from the top surface toward the bottom surface of the deck board in the direction extending away from the outermost edge and toward the innermost edge such that the upper edge of the corresponding runner overlaps essentially the entire thinner portion so as to hold down the corresponding innermost edge against shrinkage and against impact forces upon the outermost edge of the outermost deck board in said direction;

the thinner portion of the deck board being a rabbet and the runner having a recess therein to receive said rabbet;

a second pair of spaced apart runners;

a plurality of spacers affixed to a runner of each pair of the spaced apart runners to leave at least two openings between the said runners;

the outermost edge of each of the second pair of runners having a second plurality of dadoes therein, each of said dadoes in one of said runners being opposite one of said dadoes in the other of said runners; and

a second plurality of deck boards stretching between the second pair of runners;

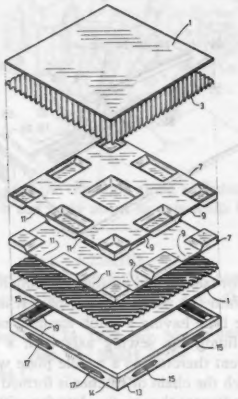
each of the second plurality of deck boards engaging a dado in each of the second pair of runners such that the second plurality of deck boards and the second pair of runners are at the same level to form the bottom of the pallet.

4,220,100

SYMMETRICAL PALLETS

Manuel W. Palomo, 2530 Thornlodge Dr., Mississauga, Ont., (L5K 1K5), Canada, and Michael B. Kitchen, 1132 Greenoaks Dr., Mississauga, Ont. (L5H 3A2), Canada

Filed Feb. 28, 1979, Ser. No. 15,955
Int. Cl.[2] B65D *19/32*
U.S. Cl. 108—51.1 11 Claims



1. A unitized composite pallet formed by a plurality of structural components comprising a pair of solid flat exterior decks, an interior fork entry core portion and a perimeter compression strip integrating said structural components, said perimeter compression strip being generally U-shaped having an outwardly facing base portion, and inwardly extending leg portions overlapping said exterior decks and being provided with a plurality of fork entries spaced along its length surrounded interiorly by inwardly extending tab portions fitted into said interior fork entry core portion; said leg portions and said base portion co-operating with said tab portions to locate, stress and lock said structural components in place, said tab portions providing a guide and a protector to said interior core portion.

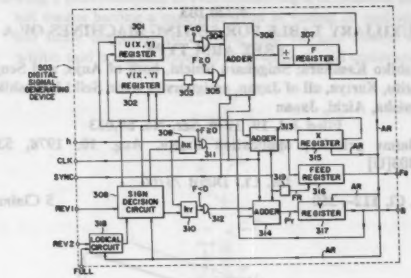
4,220,101

AUTOMATIC PATTERN GENERATION TYPE SEWING MACHINE

Sadaaki Nanai, and Akinobu Iwako, both of Tokyo, Japan, assignors to Kabushiki Kaisha Yaskawa Denki Seisakusho, Kitakyushu, Japan

Filed Sep. 25, 1978, Ser. No. 945,119
Claims priority, application Japan, Oct. 4, 1977, 52-120269
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E 8 Claims

1. In an automatic pattern generation type sewing machine, a digital signal generating device including function generation means for sequentially calculating stitch positions in accordance with an arithmetic function and selected input parameters and means for outputting digital signals corresponding to the calculated stitch positions, said function generation means being operable in accordance with signals synchronous with the rotation of the arm shaft of the sewing machine and with pulses from a clock pulse generator which have a higher frequency than said synchronous signals, and a servo driving device which employs said digital signals as feed and bight positions of the needle of said sewing machine to move a piece



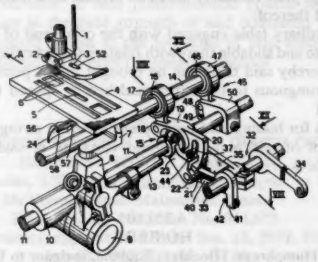
of cloth or the needle and thereby form a particular stitch pattern.

4,220,102

LOOPER CONTROL APPARATUS FOR SEWING MACHINES

Pietro Draghiccio, and Enrico Villa, both of Corsico, Italy, assignors to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Jun. 6, 1979, Ser. No. 45,906
Claims priority, application Italy, Jun. 13, 1978, 24491 A/78
Int. Cl.[3] D05B *1/06, 1/10*
U.S. Cl. 112—200 8 Claims



1. A looper control apparatus for sewing machines of the type for forming seams of double chain stitches in both a forwardly and reverse direction of sewing, having a presser foot and a needle plate and at least one needle with an independent thread service, reciprocably driven in a rectilinear pathway between positions above and below the needle plate, said looper control apparatus comprising:

(a) a looper having an independent thread source mounted beneath the needle plate for movement perpendicular to the pathway of the needle to take a loop of thread from the latter and form a triangle of threads to be penetrated by the needle;

(b) a first driving means connected to said looper for effecting alternating back and forth movement thereof perpendicular to the direction of sewing;

(c) a second driving means connected to said looper for moving the same parallel to the direction of sewing with the combination of said first and second driving means forming an elliptical pathway for said looper, winding about the rectilinear pathway of the needle, when sewing in a forwardly direction; and

(d) disconnecting means operatively connected to said second driving means for deactivating the latter when sewing in a reverse direction to effect actuation of said looper

solely by said first driving means in a rectilinear pathway and at one side only of the needle.

4,220,103

AUXILIARY TABLE FOR SEWING MACHINES OF A FREE ARM TYPE

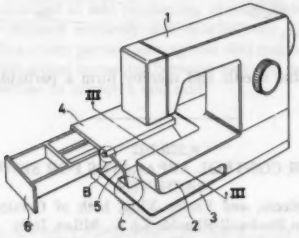
Takahiko Kasahara; Shigeharu Shichi, both of Anjo, and Senji Suito, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 19, 1979, Ser. No. 59,033

Claims priority, application Japan, Aug. 10, 1978, 53-110403[U]

Int. Cl.[2] D05B *73/00*

U.S. Cl. 112—260 **5 Claims**



1. A sewing machine having a main body, a cylindrical bed integrated with said main body and a base member fixed to said main body, comprising:

a hinge plate rotatably mounted on said base member at one end thereof;

an auxiliary table engaged with the other end of said hinge plate and slidable therewith relative to said cylindrical bed whereby said table can be brought into a position either continguous to the cylindrical bed or spaced therefrom; and

means for biasing said hinge plate, wherein swinging movement of said hinge plate and vibration of said auxiliary table is prevented.

4,220,104

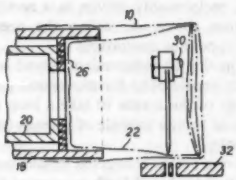
HOSIERY

John C. Humphreys, Hinckley, England, assignor to Paramount Textile Machinery Co., High Point, N.C.

Filed Oct. 4, 1978, Ser. No. 948,492

Int. Cl.[2] D05B *1/00, 97/00*

U.S. Cl. 112—262.1 **21 Claims**



1. A method of seaming a gusset to a garment comprising supporting the garment and presenting the gusset to the garment with the periphery of the gusset juxtaposed with the garment, and mechanically continuously seaming the garment and the periphery of the gusset together while simultaneously rotating the gusset and the garment relative to a seaming machine and through at least 360° about an axis passing through the gusset to secure the gusset to the garment by a single continuous seam.

4,220,105

DEVICE FOR CUTTING AND POSITIONING A CHAIN OF STITCHES ON A SEWING MACHINE

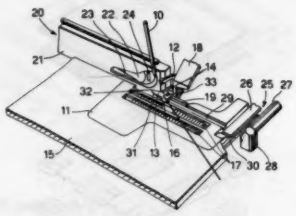
Giovanni Palacino, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Feb. 12, 1979, Ser. No. 11,262

Claims priority, application Italy, Feb. 17, 1978, 20359 A/78

Int. Cl.[3] D05B *65/06*

U.S. Cl. 112—287 **3 Claims**



1. A device for cutting and positioning a chain of stitches for incorporation into the initial stitches of a seam on a sewing machine of the type having a stitch forming needle and feed mechanism defining the sewing axis with a trimmer knife mounted adjacent thereto and a needle plate with an integral tongue on which the chain of stitches is formed with a suction tube mounted adjacent the needle plate for withdrawing from and receiving the chain formed on the tongue, said cutting and positioning device comprising:

(a) a cutting knife within the suction tube for severing the chain drawn therein from the tongue;

(b) an orienting device within the suction tube for ejecting the severed chain from the latter and directing it to a location forwardly of the needle;

(c) a gripping apparatus for receiving the severed chain ejected by said orienting device; and

(d) means traversing the distance between the tongue and said gripping apparatus defining an open channel formed in and communicating with the upper surface of the needle plate for maintaining the chain of stitches below the upper surface of said needle plate and in parallel alignment with the sewing axis to effect the locking in thereof with the initial stitches during its incorporation into the next seam being formed.

4,220,106

PROCESS AND APPARATUS FOR ANNEALING CAN BODIES

Helmuth Supik, Braunschweig, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca GmbH, Braunschweig, Fed. Rep. of Germany

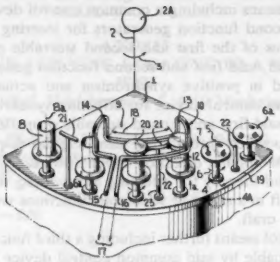
Filed Aug. 15, 1978, Ser. No. 933,936

Int. Cl.[3] B21D *51/00*; H05B *5/00*

U.S. Cl. 113—120 Y **16 Claims**

1. In the process of forming a can body of steel sheet wherein the can body has a free open end portion to be flanged preparatory to the securement of an end unit thereto by a folding and seaming operation; the method of annealing the free open end portion by heating the free open end portion to an annealing temperature while simultaneously generating an

inert gas atmosphere around the free open end portion, said heating being effected by fixed inductive heating means while



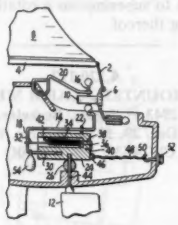
continuously moving the can body along a predetermined path and rotating each can body about its axis while being heated.

4,220,107

WIND CONTROLLED SELF-STEERING MECHANISM

Terrence D. Jacobs, Sr., 6056 College Ave., Oakland, Calif. 94618

Filed May 24, 1979, Ser. No. 41,986
Int. Cl.³ B63H *25/04*
U.S. Cl. 114—144 C **8 Claims**



1. A steering mechanism for a sailing vessel having a mainsail and boom, a hull and a rudder, comprising

(a) a stabilizer mounted to the hull so as to pivot in a plane generally perpendicular to the lengthwise axis of the vessel,

(b) means connecting the stabilizer to the boom, said means transmitting to the stabilizer a force proportional to the resultant of the velocity and angle of the wind striking the mainsail,

(c) a pressure sensing member upon which the stabilizer presses in response to said force, said pressure sensing member positioned to impede movement of the stabilizer, and

(d) a linkage mechanism upon which the pressure sensing member is mounted, said mechanism adapted to turn the rudder when the stabilizer exerts less than a pre-determined force upon the pressure sensing member, and further adapted to permit the stabilizer to disengage the pressure sensing member when the stabilizer exerts greater than a pre-determined force.

4,220,108

MINESWEEPING METHOD AND APPARATUS

Wayne E. Burt, 1603 Avenue R., Huntsville, Tex. 77340

Filed Sep. 27, 1968, Ser. No. 763,419
Int. Cl.³ B63G *9/00*
U.S. Cl. 114—244 **10 Claims**

10. A method of sweeping underwater magnetic mines along a predetermined course in a body of water to be navigated by a minesweeper surface craft having a small but finite magnetic field associated therewith, said method comprising the steps of:

marking said predetermined course to make it visible;

towing a minesweeping device containing a permanent magnet means having a magnetic field in excess of said small but finite magnetic field along said marked course and within said body of water so as to subject said underwater

magnetic mines to the field of said contained permanent magnet means; and

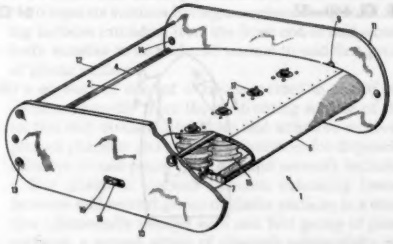
moving said contained magnet means arcuately in a direction transverse to said predetermined course to cause variations in the field strength of said contained permanent magnet means at the locations of said underwater magnetic mines to effect detonation thereof.

4,220,109

DEVICE FOR CONTROLLING THE DEPTH OF AN ELEMENT TOWED IN WATER

Jacques Cholet, L'Etang la Ville, France, assignor to Institut Francais Du Petrole, Rueil Malmaison, France

Filed Sep. 22, 1978, Ser. No. 944,675
Claims priority, application France, Sep. 23, 1977, 77 29244
Int. Cl.² B63B *39/06, 43/04*
U.S. Cl. 114—245 **10 Claims**

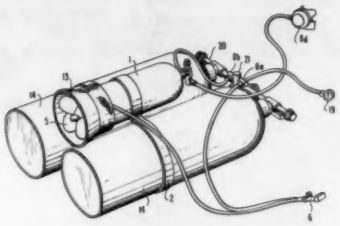


1. A device for controlling the depth of an element moving through water so as to maintain it at a reference depth, comprising a wing pivotable with respect to the element, characterized in that said wing comprises at least two walls forming the lower wing surface and the upper wing surface, movable with respect to each other, and a system for converting the space variation between the two walls, in response to the hydrostatic pressure variation, to a rotation of the wing about an axis of rotation rigidly secured to the submerged element.

4,220,110
UNDERWATER PROPULSION UNIT

James E. Roberson, Sr., and James E. Roberson, Jr., both of 212 Seneca Dr., Forest Heights, Md. 20021

Filed May 1, 1978, Ser. No. 901,677
Int. Cl.[2] A63B *35/12*
U.S. Cl. 114—315 7 Claims



1. A self-contained underwater propulsion unit for use in combination with a breathing medium supply means, comprising

(a) a housing comprising a pressure vessel and having inlet and outlet ends;

(b) means for mounting said housing for use by a diver;

(c) propulsion means comprising an hydraulic motor means having a drive shaft with a propeller thereon;

(d) means for supplying and removing approved breathing air compressor oil for said hydraulic motor;

(e) means for controlling breathing medium to said hydraulic motor means, wherein said breathing medium is used to circulate said compressor oil;

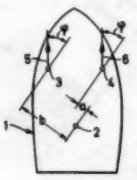
(f) filter means adjacent the outlet end of said housing; and

(g) means for regulating the pressure of said breathing medium.

4,220,111
DRIVE AND CONTROL DEVICE FOR WATERCRAFT OR THE LIKE HAVING AT LEAST ONE PAIR OF STEERABLE PROPELLERS

Franz Krautkremer, and Siegfreid Lais, both of Spay, Fed. Rep. of Germany, assignors to Schottel-Werft Josef Becker GmbH & Co. KG, Overspay, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,624
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718831
Int. Cl.[3] B63H *25/00*
U.S. Cl. 440—53 14 Claims



1. In a drive and control device for watercraft or the like having at least one pair of steerable propellers which are arranged on both sides of the longitudinal axis of the craft and are pivotable about respective vertical axes and are controllable for such pivoting, the improvement comprising:

an initial position of said steerable propellers in which (1) the direction of the thrust of each is positioned at a right angle to the connecting line between the center of lateral resistance of the watercraft and the respective said vertical pivot axis, and (2) said steerable propellers of each pair are directed to cause straight forward travel of the watercraft and produce equal but opposite torques about the lateral center of resistance of the watercraft; and

control means including a common control device and first and second function generators for steering the pivoted positions of the first and second steerable propellers of said pair, said first and second function generators being coupled in positive synchronism and actuable by said common control device for effecting synchronous pivoting of said first and second steerable propellers from said initial position through the same angular displacement in the same angular direction about their respective vertical axes, and thereby for effecting a traversing movement of the craft in a range of selectable directions without rotating the craft,

said control means further including a third function generator actuable by said common control device for steering the thrust direction of said steerable propellers when said steerable propellers have their thrust directions in parallel,

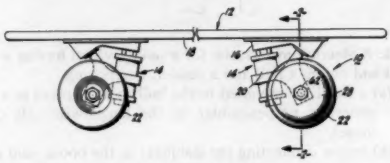
said control means further including selector means actuable for alternatively selecting said traversing movement of said craft and said parallel pivoting of said steerable propellers, by switching between said first and second function generators on the one hand said third function generator on the other hand,

said control means further including superimposing means actuable for causing said first and second function generators to adopt settings different from each other and thereby for superimposing an asynchronous pivoting of said steering propellers on said synchronous pivoting thereof, so as to superimpose a rotation of said craft on said traversing thereof.

4,220,112
WHEEL MOUNTED ALARM MECHANISM

Roger P. Neilsen, 2943 Hillegass, Berkeley, Calif. 94705

Filed Dec. 29, 1978, Ser. No. 974,371
Int. Cl.[3] A63C *17/26;* B60Q *5/00*
U.S. Cl. 116—56 3 Claims



1. A portable alarm mechanism associated with a wheel being movable in relation to a bearing supported axle comprising:

a. vibratory body including projecting means;

b. striker means for contacting said projecting means of said vibratory body, said vibratory body and striker comprising a signal producing unit; and

c. a plurality of concentric means including first elongated spacer means and second elongated threaded means for permitting axial turning between said striker means and said vibratory body with the axial rotation of the wheel, said first elongated spacer means comprising a spring spacer having a first end portion and a second end portion, said first end portion of said spring spacer engaging the wheel for movement therewith, an element having a first side and a second side, said first side of said element frictionally engaging said second end portion of said spring spacer for movement therewith, said second elongated threaded means adjustably connected at one end thereof to the axle of the wheel, a bearing interposed said element and the other end of said second elongated threaded means, said vibratory body and said striker means being adjustably fixed to said second elongated threaded means

and said second side of said element such that said striker means and said projecting means of said vibratory body contact each other during revolution of the wheel.

4,220,113

DEVICE FOR APPLYING A COATING TO A MATERIAL WEB

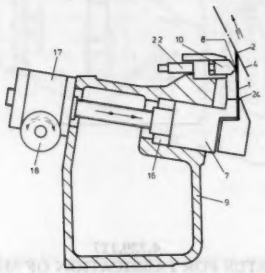
Gerhard Wohlfeil, Habichtstrasse 7, 4019 Monheim, Fed. Rep. of Germany

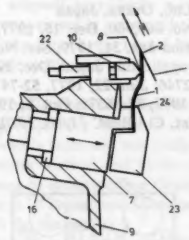
Filed Sep. 27, 1978, Ser. No. 946,132

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1978, 2825907

Int. Cl.² C03C 25/00

U.S. Cl. 118—126 6 Claims





1. In a device for the continuous application of a coating of constant thickness to a material web, being transported over a rotating mating roll of the type including an elastic coating knife having two edges, one of said edges being fixed in a clamping jaw and the other edge being free, said coating knife being initially in an unstressed condition, the fixed edge defining a fixing line in said clamping jaw and said free edge being parallel thereto, said free edge abutting said material web along a line defining an abutting line at a predetermined angle of incidence between said coating knife and said material web, the coating material being applied to said moving web such that the coating material passes between the free edge of said knife and said web for controlling the thickness of said coating material applied thereto, said coating knife being supported between said abutting line and said fixing line by support means along a line defining a supporting line, and said clamping jaw being pivotable about said abutting line and around an axis outside said fixing line for setting said predetermined angle of incidence, the improvement comprising:

means for moving said fixing line to impart to and vary the stress of said coating knife and thereby adjust the thickness of said coating material under continuous coating operating conditions and for maintaining the geometric configuration of said coating knife between said abutting line and said supporting line substantially fixed relative to said mating roll upon movement of said fixing line, said moving means including linear guidance means connected to said clamping jaw for shifting the clamping jaw and thereby said fixing line relative to said mating roll linearly along a plane defining an acute angle with respect to the plane of said unstressed coating knife whereby said angle of incidence is substantially unchanged upon varying of the stress of said coating knife.

4,220,114

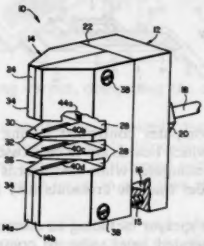
APPLICATOR HEAD FOR ADHESIVE APPLICATION SYSTEM

Richard D. Radowicz, 25860 Rancho Alto Dr., Carmel, Calif. 93923

Filed Sep. 22, 1978, Ser. No. 944,762

Int. Cl.² B05C 5/02, 7/00

U.S. Cl. 118—411 3 Claims



1. A dispensing head for applying adhesive to a contoured surface of one object which is to be bonded to a complementary surface of another object, said dispensing head comprising:

(a) a first body member adapted for connection to a supply of adhesive and including an internal plenum chamber for receiving adhesive from said supply;

(b) a second body member having front and back ends and being disengagably connected with said first member, said second body member including

(i) an adhesive applying surface substantially complementary to the contoured surface of said one object, said adhesive applying surface being located on said front end and including a first group of spaced-apart planar surfaces which substantially lie in a common plane and a second group of spaced-apart planar surfaces which project out from said first group of surfaces, said second planar surfaces intersecting said first planar surfaces so as to define substantially parallel lines of intersection,

(ii) two separate sections having complementary confronting surfaces extending from the front end of said second body member to its back end normal to said first group of planar surfaces,

(iii) a network of opened channels located in one of said sections inwardly from the confronting surface of that section and extending between said adhesive receiving plenum chamber and said planar surfaces for dispensing adhesive to said planar surfaces, said network including a first group of opened channels extending inward between said second group of planar surfaces in a direction substantially parallel with said first group of planar surfaces, a second group of channels substantially narrower than said first group of channels and extending between said first group of channels and said plenum chamber, and a third group of channels substantially narrower than said first group and extending between said first group of planar surfaces and said plenum chamber, and

(iv) means for disengagably connecting said sections together so that said confronting surfaces engage one another and so that each of said channels is closed along its length.

4,220,115

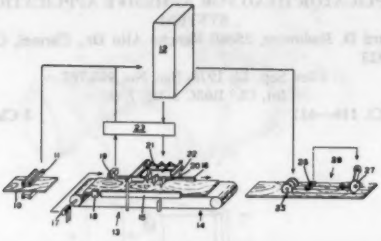
LUMBER MARKING APPARATUS

William C. Brossman, East Earl; Joseph G. McElhaney, Wrightsville, and James H. Rooney, III, Lancaster, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Mar. 23, 1978, Ser. No. 889,266

Int. Cl.[2] B05C *11/00*

U.S. Cl. 118—684 **2 Claims**



1. In a computer controlled sawing system in which the position at which boards are to be crosscut is marked by direction of said computer while said boards are moving on a conveyor in order that the crosscuts may later be automatically made:

(a) a paint sprayer including an atomizing air nozzle, a solenoid-operated paint valve to control paint flow to said nozzle, and a solenoid-operated air valve to control air flow to said nozzle;

(b) a tachometer generator connected to said conveyor which operates to produce pulses at a rate proportioned to the speed of said conveyor and the board moving thereon;

(c) a photoelectric unit which provides a step function output when a board moves past said unit on said conveyor;

(d) electronic circuitry connected to said tachometer and said photoelectric unit including a monostable multivibrator means coupled to an AND gate to provide an output signal of digital pulses to said computer, which signal defines the speed and location of boards on said conveyor; and

(e) means for controlling said paint and air valve solenoids in order that signals from said computer directing the operation of said solenoids may be processed to provide relief valve sequence timing, said means for controlling said paint and air valve solenoids comprising:

(1) a first monostable multivibrator;

(2) a first NAND gate coupled to receive the output of said first multivibrator;

(3) a first power transistor connected to said first NAND gate and said air valve solenoid;

(4) a second monostable multivibrator coupled to receive an output from said first multivibrator;

(5) a third multivibrator coupled to receive the output of said second multivibrator;

(6) a second NAND gate coupled to receive the output of said third multivibrator; and

(7) a second power transistor connected to said second NAND gate and said paint valve solenoid.

4,220,116

REACTANT GAS FLOW STRUCTURE FOR A LOW PRESSURE CHEMICAL VAPOR DEPOSITION SYSTEM

Arthur K. Hochberg, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 30, 1978, Ser. No. 955,653

Int. Cl.[3] C23C *11/00, 13/08*

U.S. Cl. 118—715 **12 Claims**

8. In a low pressure chemical vapor deposition system, the structure comprising:

a chamber having an axis; and

a plenum mounted in said chamber parallel to said axis and to one side of said chamber said plenum being provided with aperture means for injecting a reactant gas at subatmospheric pressure into said chamber to provide a uniform distribution of said gas along the axis of said chamber.

4,220,117

APPARATUS FOR FABRICATION OF MAGNETIC RECORDING MEDIA

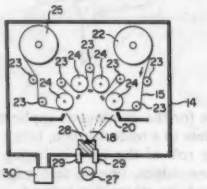
Koichi Shinohara, Kobe, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 860,960, Dec. 15, 1977, abandoned. This application Jan. 31, 1979, Ser. No. 8,083

Claims priority, application Japan, Dec. 29, 1976, 51-159591; Jan. 12, 1977, 52-2746; Jun. 22, 1977, 52-74702; Jul. 12, 1977, 52-83851; Jul. 18, 1977, 52-86371; Oct. 5, 1977, 52-120362

Int. Cl.[2] B05C *13/08, 19/02*

U.S. Cl. 118—718 **2 Claims**



1. A vacuum thin film deposition apparatus comprising a vacuum vessel or chamber divided into upper, intermediate and lower spaces which are substantially close to each other; said spaces being arrayed in a vertical column; each of said spaces being connected to independent evacuation systems; a mechanism for unwinding a flexible substrate, a mechanism for winding said flexible substrate and a plurality of discharge treatment devices which are disposed in the upper space; two pairs of a cylindrical rotary drum which are reversible in rotation and an evaporation source which are disposed in the intermediate space in opposed relationship; one pair of a cylindrical rotary can which is reversible in rotation and an evaporation source which are disposed in the lower space; and independent gas introduction systems which are connected to said upper, intermediate and lower spaces.

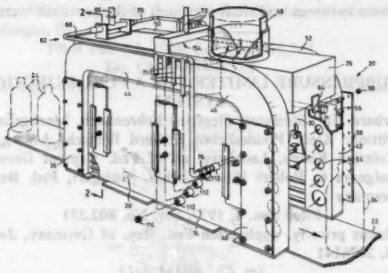
2. A vacuum thin film deposition apparatus according to claim 1 wherein the evacuation system is connected to the top of the upper space; the evacuation system is connected to both lateral sides of the intermediate space; and the evacuation system is connected to the bottom of said lower space.

4,220,118

SPRAY HOOD

Leon Levene, Thornhill, and R. Wayne McClung, Cambridge, both of Canada, assignors to Domglas Inc., Mississauga, Canada

Filed Aug. 15, 1978, Ser. No. 934,131
Int. Cl.[2] B05C *19/02*; C23C *11/00*
U.S. Cl. 118—720 6 Claims



1. A spray hood for use in coating glassware, such as bottles, the spray hood comprising:

means defining a tunnel having an entrance end and and an exit end and adapted to straddle a conveyor carrying glassware for movement in a generally horizontal coating path through the tunnel, the tunnel having upright first and second side walls and a top extending between the side walls;

first and second baffle assemblies disposed inside the tunnel and including respective first and second baffle means extending inwardly from said side walls of the tunnel, and means permitting vertical and horizontal adjustment of the baffle means to accommodate therebelow, portions of the glassware to be coated and allow passage of the glassware through the tunnel;

a coating supply system coupled to said first and second side walls of the tunnel for supplying a gas-borne vapour of coating material into the tunnel below the baffle assemblies;

a first pair of exhaust manifolds located at the entrance end of the tunnel on respectively opposite sides of said coating path, and a second pair of exhaust manifolds located on respectively opposite sides of said path at the exit end of the tunnel, said manifolds including intake openings through which excess gas-borne coating vapour can be drawn into said manifolds, said intake openings being disposed laterally of said coating path only and being dimensioned so that the intake opening area for each manifold is at a maximum adjacent a lower end of the manifold and progressively decreases in a direction away from said lower end, whereby gas-borne coating vapour introduced into said tunnel from the coating supply system in use is drawn about and deposited on said portions of the glassware below the baffle means as said vapour passes from the supply system to the exhaust manifolds, and a relatively high density of coating material vapour is maintained in lower portions of the tunnel and;

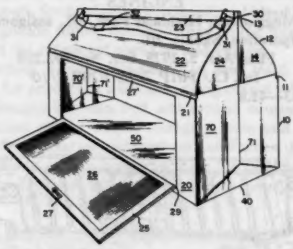
an inlet manifold extending into the tunnel and disposed above the baffle assemblies, said manifold being adapted to feed air into the tunnel to cause a positive pressure tending to prevent upward flow of coating material past the baffle assemblies.

4,220,119

PET-HANDBAG CARRIER COMBINATION

D. Janine Albright, 1687 Chateau Ave., Anaheim, Calif. 92802

Filed Aug. 16, 1978, Ser. No. 934,379
Int. Cl.[3] A01K *1/00*
U.S. Cl. 119—19 10 Claims



1. A pet and handbag carrier, comprising the combination of:

a lower compartment having two oppositely disposed generally rigid sides and two oppositely disposed ends integral with said sides and generally orthogonal with said sides, each of said sides being larger in area than either of said ends;

a swivable gate integral with one of said sides, said gate extending over most of the area of said one of the sides and being larger in area than either of said ends, said gate constituting means for visual communication, ventilation and access by said pet to said lower compartment; and

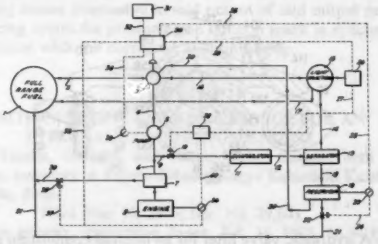
an upper compartment having two swivable sections integral with the lower compartment.

4,220,120

INTERNAL COMBUSTION ENGINE SYSTEM AND OPERATION

Hugh R. Jackson, deceased, late of Fullerton, Calif. (by Ellin E. Jackson, executrix), and Robert H. Haas, Fullerton, Calif., assignors to Union Oil Company of California, Los Angels, Calif.

Continuation of Ser. No. 128,874, Mar. 29, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 425,170
Int. Cl.[2] F02M *13/04*
U.S. Cl. 123—3 18 Claims



1. The method of operating an internal combustion engine employing a vaporizable liquid full range fuel mixture of constituents having different boiling points including the steps of separating at least a portion of said fuel into at least two fractions including a higher boiling fraction and a lower boiling fraction and operating said engine at least in part on said lighter boiling fraction at least when the operating temperature or said engine is below a predetermined minimum, and further operating said engine at least in part on said heavy fraction accumulated during at least a portion of the time said engine operates,

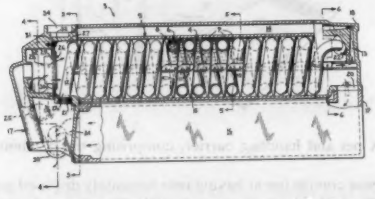
said heavy fraction being supplied to said engine through a liquid fuel pump when the temperature in said liquid fuel pump exceeds a predetermined maximum.

4,220,121

HEAT EXCHANGER FOR MARINE PROPULSION ENGINES

Mario A. Maggiorana, Highland Park, Ill., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 5, 1978, Ser. No. 893,258
Int. Cl.[2] F01P 7/16; F28B 9/10
U.S. Cl. 123—41.8 **13 Claims**



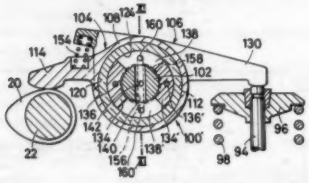
1. A cooling system for an internal combustion engine in which a liquid coolant is circulated through the engine, said coolant having entrained gases, comprising a housing means having a spiral flow directing means directing the coolant to flow in a spiral passageway and developing centrifugal forces causing the liquid coolant to move outwardly within said passageway, a gas collection means located generally centrally of the spiral flow directing means for withdrawing said entrained gases from said liquid coolant, and a means located within the radial outer portion of the spiral passageway in radially spaced relation to said gas collection means for cooling the coolant passing through spiral passageway in the housing means.

4,220,122

HYDRAULIC VALVE LIFTER

Syunichi Aoyama, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 13, 1978, Ser. No. 941,855
Claims priority, application Japan, Sep. 14, 1977, 52-111286
Int. Cl.[2] F01I 1/14
U.S. Cl. 123—90.55 **10 Claims**



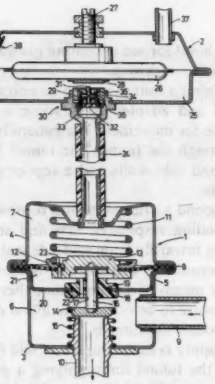
1. A hydraulic valve lifter for an internal combustion engine having at least one power cylinder including intake and exhaust valves, a cam for operating at least one of the valves and a source of fluid under pressure continuously variable with the power output of the engine, comprising a shaft having a center axis therethrough, a first rockable member pivotable on said shaft about said center axis and engaging said cam, a second rockable member pivotable on said shaft about the center axis of the shaft and engaging at least one of said valves, the first and second rockable members being formed with respective concavities forming in combination an annular cavity encircling an axial portion of said shaft, first and second partition members fitting in said annular cavity and rotatable with said first and second rockable members, respectively, about the center axis of said shaft, the first and second partition members forming therebetween arcuately curved variable-volume fluid chambers which are continuously variable in volume in complementary relationship to each other depending upon the relative angular position between said shaft and each of the partition members, said shaft having formed in said axial portion thereof a fluid passageway which is in constant communication with said source of fluid and which is open to at least one of said variable-volume fluid chambers or closed by at least one of said partition members depending upon the relative position between said shaft and each of the partition members.

4,220,123

SUBPRESSURE LIMITER FOR A FUEL INJECTION SYSTEM

Eberhard Utz, Stuttgart; Siegfried Fehrenbach, Markgrönigen; Dittmar Klett, Pleidesheim; Richard Bertsch, Asperg, and Heinrich Knapp, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 1, 1977, Ser. No. 802,331
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1976, 2626141
Int. Cl.[2] F02M 7/12
U.S. Cl. 123—327 **11 Claims**



1. A subpressure limiter for a fuel injection system of a mixture compressing, externally ignited internal combustion engine having a suction tube containing an arbitrarily actuatable throttle valve in which an apportioned fuel quantity is injected into the suction tube, the suction tube including suction tube sections upstream and downstream of the flap of the throttle valve wherein the improvement comprises, a bypass for interconnecting said upstream and downstream sections of said suction tube, a subpressure limiter for varying the cross-sectional area of said bypass, said subpressure limiter including a pressure-dependent control element that responds to the subpressure prevailing within the suction tube section downstream of the throttle valve during an overrunning operation, said pressure-dependent control element comprising a control valve, a pre-control capsule, including a pressure-responsive capsule in the form of an evacuated elastic hollow body arranged to actuate said control valve and a chamber connected to said suction tube section downstream of said throttle valve in which said hollow body is confined, a bypass control capsule associated with said control valve, said bypass control capsule comprising a housing provided with first and second chambers and an intermediate diaphragm, the first of said chambers connected to a first line in communication with said suction tube section upstream of the throttle valve, said last

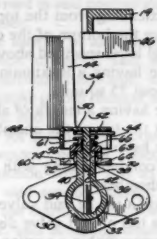
named chamber also connected to a second line in communication with said suction tube downstream of said throttle valve, valve means associated with said diaphragm arranged to close said second line, throttling means providing for communication between said first and second chambers and spring means in said second chamber serving to bias said valve means in a closing direction.

4,220,124

ADJUSTABLE AIR VANE GOVERNOR

Richard L. Morris, Galesburg, Ill., and William H. Wulff, Cedar Grove, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 15, 1978, Ser. No. 915,764
Int. Cl.[2] F02D *11/02*
U.S. Cl. 123—391 **5 Claims**



1. An internal combustion engine comprising a carburetor including therein a throat, and a cylindrical stem projecting transversely from said throat and having a central bore communicating with said throat, a pivotal throttle member positioned in said throat and pivotable from an open position to a fluid flow restricting position, a movable air vane, a rotatable shaft positioned in said central bore and connected to said air vane and to said throttle member for moving said throttle member in response to movement of said air vane, means responsive to engine rotation for impelling air against said air vane so as to move said air vane and so as to urge said throttle member to said flow restricting position, resilient means having one end connected to said throttle member for urging said throttle member toward said open position and having a second end, adjustment means connected to said second end of said resilient means for adjusting the force of said resilient means on said throttle member, said adjustment means including an adjustment member movable axially between a first position affording rotary adjustment of said resilient means and a second position spaced axially of said shaft from said first position and anchoring said second end of said resilient means, and locking means independent of said resilient means for releasably preventing axial movement of said member from said second to said first positions and for preventing rotary adjustment of said member when in said second position.

4,220,125

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Minoru Nishida; Tadashi Hattori, both of Okazaki, and Hiroaki Yamaguchi, Nukata, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 28, 1978, Ser. No. 891,127
Claims priority, application Japan, May 27, 1977, 52-62658
Int. Cl.[2] F02M *52/00*
U.S. Cl. 123—407 **4 Claims**

1. An ignition timing control system for internal combustion engines comprising:

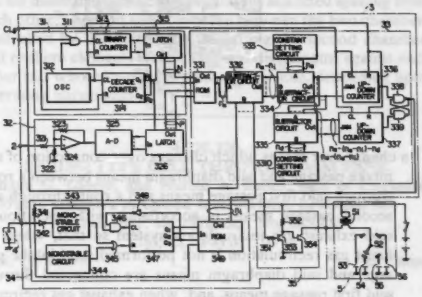
first detecting means, responsive to an intake condition of an engine, for producing a first detection output indicative of the intake condition;

second detecting means, responsive to the rotation of said engine, for producing a second detection output indicative of the rotational speed;

third detecting means, responsive to movement of the throttle valve of said engine, for producing a third detection output related to the movement of the throttle valve to and from a closed position;

first setting means, responsive to said first and second detection outputs, for producing a first setting output indicative of the ignition timing corresponding to the intake condition and the rotational speed of said engine;

second setting means, responsive to said third detection output, for producing a second setting output which gradually changes between first and second constant values, said second setting output changing from said first constant value to said second constant value when the throttle valve of said engine is opened from the closed condition and changing from said second constant value to said first



constant value when the throttle valve of said engine is closed from the open condition;

means responsive to said first and second setting outputs for producing an output indicative of ignition timing, said ignition timing output gradually changing, in response to said second setting output, when said throttle valve leaves or enters a fully closed position, so that a resultant advance angle is gradually increased at a rate less than the rate of change of said first setting output when said throttle valve is opened from the fully closed position, and the resultant advance angle is gradually decreased at a rate less than the rate of change of said first setting output when said throttle valve is fully closed thereby to prevent the ignition timing being varied rapidly; and

igniting means responsive to said output of said output producing means for producing an ignition spark in synchronization with the corrected ignition timing.

4,220,126

IGNITION TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Kazuo Tomita, Gotenba, and Nobuo Habu, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 16, 1979, Ser. No. 39,641
Claims priority, application Japan, Jul. 24, 1978, 53/90199; Feb. 2, 1979, 54/13209
Int. Cl.[3] F02P *5/04;* **F02M** *25/06*
U.S. Cl. 123—411 **8 Claims**

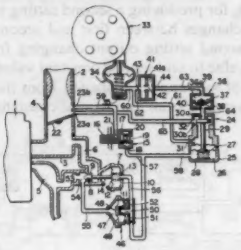
1. An ignition timing control device for an internal combustion engine having intake and exhaust passages and an exhaust gas recirculation system which includes an exhaust gas recirculation control valve and selectively recirculates exhaust gases from said exhaust passage to said intake passage, comprising:

a vacuum advancer which has a diaphragm means and advances ignition timing of the engine in accordance with vacuum supplied to said diaphragm means,

first and second passage means which alternatively connect

said intake passage and said diaphragm means so as to conduct fluid pressure therebetween,

a delay and hold means related with said second passage means which includes a check valve, a surge space and a delay means and delays transmission of vacuum from said intake passage to said diaphragm means effected through said second passage means, while it holds the largest vacuum generated in said second passage means for said diaphragm means, and



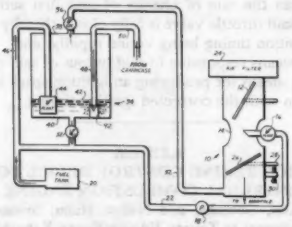
a changeover means which changes over connection of said intake passage and said diaphragm means between a route through said first passage means and a route through said second passage means in accordance with operation of said exhaust gas recirculation system so that, when exhaust gas recirculation is not performed, said intake passage and said diaphragm means are connected through said first passage means, and, when exhaust gas recirculation is performed, said intake passage and said diaphragm means are connected through said second passage means.

4,220,127

FUEL VAPORIZER

Alfred L. Reynolds, Plainview, Tex., assignor to James P. Federer, Cheyenne, Wyo.

Filed Oct. 28, 1977, Ser. No. 846,401
Int. Cl.³ F02M *17/22*
U.S. Cl. 123—522 **13 Claims**



1. In an automobile having a spark ignition engine, the improved structure comprising in combination:

a. a crankcase,

b. a manifold,

c. a carburetor on the manifold having

(i) a choke valve, and

(ii) a throttle valve,

d. an air cleaner on the carburetor,

e. a fuel tank,

f. a fuel line from the fuel tank to the carburetor,

g. a fuel pump in the fuel line,

h. a vaporization chamber having a top, a bottom, an interior and cross-sectional area of about 150 cm^2,

j. a float valve in the vaporization chamber including

(i) a rigid tube from the top of the chamber extending downward into the chamber,

(ii) a valve seat member telescoped into the rigid tube,

(iii) a needle valve telescoped within the valve seat member,

(iv) said needle valve having a tail which extends through a bushing on a bottom of the valve seat member,

(v) said valve seat member having a cage attached to a lower portion thereof,

(vi) nipples on a bottom of the cage bearing against the bottom of the vaporizer chamber,

(vii) a float in the cage so that a top of the float can push a bottom of the tail up to a seat in the valve member,

k. said rigid tube being connected to said fuel line between the fuel pump and fuel tank, whereby

m. said float valve providing means for maintaining a preset fuel level of about 3 cm of fuel in the vaporization chamber,

n. a bubble tube extending from the top of the chamber to about 2 cm above the bottom of the chamber which will be below the fuel level specified above,

o. said bubble tube having a maximum internal cross sectional area of about 75 sq mm,

p. said bubble tube having a length of about 15 cm,

q. a check valve at the top of the chamber,

r. said check valve having

(i) a valve seat communicating with the interior of the vaporization chamber,

(ii) a valve disc on a top of said valve seat,

(iii) a spring on a top of said valve disc,

(iv) said spring being within a portion of the check valve designated as a spring chamber, and

(v) a nipple fully connected to said spring chamber, and

s. a check valve line extending from the nipple to a connection with the carburetor between the throttle valve and manifold,

t. a drain valve including

(i) a drain valve seat in the bottom of the chamber,

(ii) a drain valve ball on the seat, and

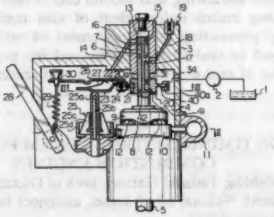
(iii) a drain line from the drain valve to the fuel line between the pump and tank.

4,220,128

DISTRIBUTION TYPE FUEL INJECTION PUMP

Masayoshi Kobayashi, Kawagoe, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1978, Ser. No. 920,393
Claims priority, application Japan, Jun. 30, 1977, 52-77176
Int. Cl.² F02M *39/00*
U.S. Cl. 123—366 **6 Claims**



1. A fuel injection pump for use in a fuel injected internal combustion engine having a fuel feed pump, said fuel injection pump comprising:

a housing having a fuel chamber contained therein, said fuel chamber being supplied with fuel by said fuel feed pump and being pressurized to the output pressure of said fuel feed pump;

a plunger having a longitudinal axis of movement, said plunger being movably mounted and forming a compres-

sion chamber within said housing at one end portion of said plunger, said plunger having a delivery stroke and a suction stroke;

driving means for reciprocally moving said plunger along said axis and for rotating said plunger about said axis;

fuel supply means for introducing fuel into said compression chamber during said suction stroke;

delivery port means for feeding fuel into the engine from said compression chamber during said delivery stroke;

a leak port formed in said plunger and connected to said compression chamber;

a control sleeve movably mounted on said plunger for normally closing said leak port and for connecting said leak port to said fuel chamber at the end of said delivery stroke to complete said delivery stroke;

a governor device actuating said control sleeve for controlling the quantity of fuel to be injected;

a first passage formed in said control sleeve and connected to said fuel chamber;

a second passage formed in said plunger and connected to said compression chamber, said second passage being arranged for normal connection with said first passage once per one stroke of said plunger at the beginning of said delivery stroke; and

actuating means for rotating said control sleeve about said plunger to connect said first passage to second passage during said suction stroke and to disconnect said first passage from said second passage during said delivery stroke during the starting operation of said internal combustion engine, said actuating means being responsive to the output pressure of said fuel feed pump to sense the completion of the starting operation and thereby connect said first passage to said second passage during said delivery stroke.

4,220,129

FUEL INJECTION SYSTEM

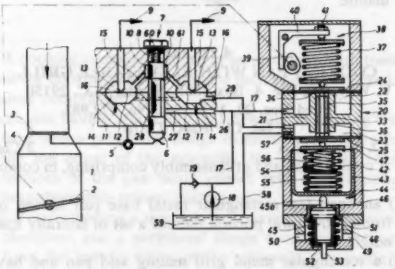
Johannes Steinwart, Obersulm-Willsbach, and Armin Bauder, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm/Württ, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,488

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757977

Int. Cl.³ F02M *39/00*; F01D *1/06*

U.S. Cl. 123—457 **6 Claims**



1. A fuel system for a mixture-compressing internal combustion engine with spark ignition having a fuel injection nozzle for continuous fuel injection, an air intake duct and an adjustable throttle valve in said intake duct, comprising: a flow sensing element in said intake duct arranged to move in accordance with the quantity of air flowing through said intake duct; a fuel metering valve actuated by said flow sensing element for dispensing a quantity of fuel substantially proportional or related to the quantity of air; means for maintaining a substantially constant pressure difference across the metering valve including a pressure sensitive valve with two chambers separated from one another by a movable partition element, and a differential pressure control valve also having two separate chambers; the first chamber of said pressure sensitive valve being subject to the pressure downstream of the metering valve and comprising a first valve aperture controlled by the movable partition element and communicating with the fuel injection nozzle, while the second chamber of said pressure sensitive valve communicates with the first chamber of said differential pressure control valve; a return line connected to the first chamber of said differential pressure control valve, while the second chamber of the differential pressure control valve is subject to the pressure upstream of the metering valve; the first chamber and the second chamber of the differential pressure control valve being separated from one another by a rigid partition and being each delimited by a diaphragm, which diaphragms are located parallel to each other; a spacing member for maintaining the two diaphragms at a fixed spacing from each other; a second valve aperture between the two chambers controlled by the diaphragm delimiting the second chamber; and resilient elements which urge said diaphragms against each other and whose loading stresses are variable, depending upon operating parameters.

4,220,130

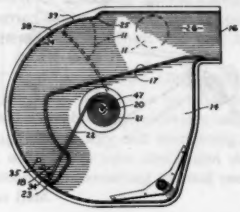
SPRING TYPE BALL THROWING MACHINE

Clinton G. Glover, and Harold A. Keller, both of Clarkston, Wash., assignors to Cytron Incorporated, Lewiston, Id.

Filed Mar. 10, 1978, Ser. No. 885,433

Int. Cl.³ F41B *7/00*

U.S. Cl. 124—7 **13 Claims**



1. A machine for throwing lightweight resilient balls, comprising:

a hollow housing;

a base for supporting the housing;

an arcuate track within the housing generated about a central axis;

an abrupt ball release point formed within the housing along the arcuate track;

an opening within the housing adjacent the ball release point;

an initial ball receiving and support station within the housing at a location therein angularly spaced about the central axis from the opening;

a shaft extending through the housing along the center axis and rotatable therein about the center axis;

means for selectively rotating the shaft about the center axis;

a throwing arm operatively mounted to the shaft for rotation about the central axis and including an outward end spaced radially inward of the arcuate track for engaging a ball at the initial ball receiving and support station and moving it along the arcuate track to the ball release point;

torsion spring means mounted to the shaft and operatively connected to the throwing arm, for torsional loading in response to rotation of the shaft and for suddenly unloading against the throwing arm, causing it to rotate forcibly about the central axis and forcibly move a ball against the track from the receiving and support station to the release point;

stop means mounted to the housing adjacent the ball receiving and support station spaced radially inward of the outward throwing arm end for initially engaging and preventing rotation of the throwing arm as the shaft is rotated to enable torsional loading of the torsion spring means and to release the throwing arm as torsional loading reaches a prescribed level allowing unloading of the torsion spring means against the throwing arm;

an energy-absorbing spring means in the rotational path of the throwing arm and connected to the shaft on both sides of the throwing arm for retarding the movement of the throwing arm after the throwing arm engages the energy-absorbing spring means and during the time it moves beyond the ball release point, thereby minimizing stress reversal in the torsion spring means; and

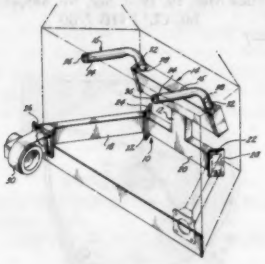
ball guide means along the arcuate track for maintaining a ball in a plane perpendicular to the central axis along the track as it is moved from the ball receiving and supporting station to the ball release point.

4,220,131

FIREPLACE AIR HEATER

David J. Livezey, Kent, Wash., assignor to Therm-Air Industries, Inc., Seattle, Wash.

Filed Nov. 21, 1977, Ser. No. 853,428
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **5 Claims**



1. an air heater insertable into a firebox, comprising: a tubular base, including an elongated side duct portion sized to extend from the front to the rear of a predetermined fireplace firebox, along a lower side portion thereof, and an elongated rear duct portion sized to extend across the lower rear portion of such firebox, said side duct portion having an air inlet at its forward end for receiving air to be heated, and at its rearward end being coupled to the rear duct portion, said rear duct portion including an upwardly directed outlet intermediate its end;

a horizontally elongated air-heater box spaced above the rear duct, said air-heater box including a downwardly directed air inlet intermediate its ends, and at least one forwardly directed heated air outlet at one end thereof;

a vertical transfer duct interconnected between the outlet of the rear duct portion of the tubular base and the inlet of said air-heater box, said vertical transfer duct being of a length to position the air-heated box in a normally relatively hot position within a fire in the fireplace firebox;

an outlet duct extending upwardly and forwardly from the outlet of said air-heater box and discharging forwardly from an upper, front corner position in the fireplace firebox;

wherein the rear duct portion of the tubular base includes a vertically elongated flange at each of its ends, each having a lower portion which depends below the tubular base to serve as a support leg for the tubular base, and with the forward part of the side duct portion of said tubular base serving as a third point of support for the tubular base, so that the tubular base is supported at three points representing corners of a triangle; and

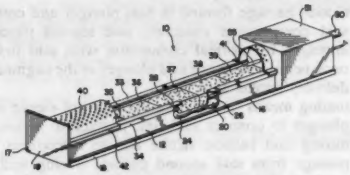
wherein the side duct portion of the tubular base includes a vertically elongated flange at its rear end matching the flange at the adjoining end of the rear duct portion of the tubular base, and wherein connector elements extend between the two flanges for coupling the side and rear duct portions of the tubular base together.

4,220,132

GAS-FIRED RADIANT BURNER

John P. Streisel, Parma, Ohio, assignor to The Barber Manufacturing Company, Bedford Heights, Ohio

Filed Dec. 13, 1978, Ser. No. 969,015
Int. Cl.[2] F23C *5/00*
U.S. Cl. 126—271.2 R **2 Claims**



1. A gas-fired radiant heater comprising:

an elongated housing;

channel forming means movably supported by said housing to accommodate heat expansion and defining an elongated upwardly facing open channel;

a quantity of loosely packed fibrous ceramic refractory blocks that becomes incandescant when heated, positioned and aligned end to end in said channel to define an upwardly facing exposed fibrous surface;

an elongated perforate mantle mounted on said housing over said exposed fibrous surface to define therewith an elongated combustion chamber;

means for closing the ends of said combustion chamber and;

nozzle means at one end of said combustion chamber for projecting a burning mixture of fuel gas and air as a flame jet into said combustion chamber to heat said fibrous ceramic refractory material and said mantel to incandescense wherely said surface and said mantle radiate heat energy in a pattern generally normal to the surface of said mantle.

4,220,133

COOKING PAN WITH ELEVATABLE GRILL

Lee V. Way, Jr., Rte. 4, Box 185F, Sumter, S.C. 29150

Filed Dec. 20, 1978, Ser. No. 972,981
Int. Cl.[3] F24C *15/16*
U.S. Cl. 126—337 A **3 Claims**

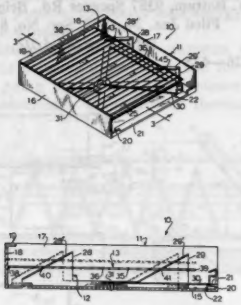
1. A cooking pan and grill assembly comprising, in combination:

(a) an open top rectangular metal base pan having on a frontal structural portion thereof a set of laterally spaced notches;

(b) a rectangular metal grill mating said pan and having spaced-apart support portions extending laterally from opposed sides thereof; and

(c) an elevating grill support mating and having a rectangular base section designed to fit loosely within said base pan, said base section having upstanding appended side structure providing a plurality of sloped camming surfaces mated to and providing support surfaces for said grill support portions and having a camming lever pivotally mounted at one end on said base section and at an opposite end adapted for manual releasable engagement with selected ones of said spaced notches of said base pan to

effect linear forward and rearward movement of said grill support in said base pan to in turn effect vertical up and



down movement of said grill on said grill support camming surfaces to regulate the elevation of said grill on said pan during cooking.

4,220,134

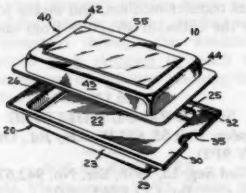
TOASTER/OVEN ACCESSORY CONTAINER

Paul V. Snyder, Whitehall, Pa., assignor to General Electric Company, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,329

Int. Cl.³ A47J *27/00*

U.S. Cl. 126—390 **21 Claims**



1. A cooking container for use as an accessory with toaster-/ovens for cooking small food items such as eggs, the cooking container comprising:

(A) a pan having a bottom and sidewalls upstanding therefrom and a peripheral flange extending outwardly from the top edges of the sidewalls, the inside and outside surfaces of the pan being coated with a dark colored heat-absorptive release coating; and

(B) a cover having a top, sidewalls extending downwardly therefrom and a peripheral flange extending outwardly from the bottom edges of the sidewalls, the inside and outside surfaces of the cover being coated with a dark colored heat-absorptive release coating, the cover being sized to cover the pan with the peripheral flange of the pan and the peripheral flange of the cover in parallel facing engagement, and means for retaining the cover from sliding off the pan;

whereby the dark release coating on the exterior surfaces of the pan and cover causes the pan and cover to absorb heat quickly, and promotes rapid cooking of food items within the cooking container.

4,220,135

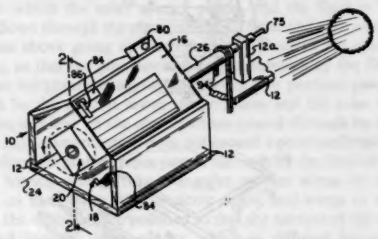
PERIODIC SOLAR COLLECTOR

Kalil A. Alkasab, 5742 Bradford Way, Hudson, Ohio 44236

Filed Jan. 2, 1979, Ser. No. 121

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—417 **11 Claims**



1. A transient mode solar energy collection apparatus comprising in combination:

a housing having at least two solar absorption sides which define an energy collection chamber within said housing;

motive means coupled to said housing for moving, responsive to a motive signal, said solar absorption sides into one of a first position characterized as being illuminated by solar energy and a second position;

a heat transfer fluid contained generally within said energy collection chamber of said housing so as to be in operative communication with said solar absorption side in said second position for absorbing thermal energy therefrom;

first means carried by said housing for coupling with and removing thermal energy from said heat transfer fluid; and

control signal means operatively coupled to said motive means for generating said motive signal, thereby reorienting one of said solar absorption sides into said first position for receiving solar energy and reorienting a previously illuminated one of said solar absorption sides into said second position for transmitting thermal energy into said heat transfer fluid.

4,220,136

SOLAR ENERGY COLLECTOR

Richard J. Penney, 3534 Scott Dr., Troy, Mich. 48084

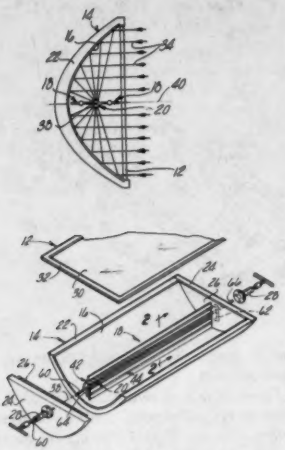
Filed Sep. 13, 1978, Ser. No. 942,137

Int. Cl.² F24J *3/02*; F28F *1/14*

U.S. Cl. 126—424 **12 Claims**

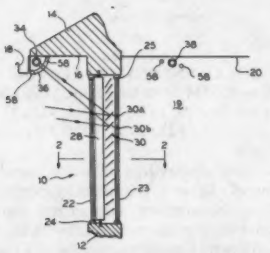
1. A sun tracking solar energy collector assembly comprising, a first generally flat and longitudinally extending absorber having absorbing faces on both sides thereof and a fluid passage in heat conducting relationship therewith and constructed and arranged to extend longitudinally generally transversely of and parallel to direct rays of solar radiation when the collector assembly is tracking the sun, a single separate second tube absorber spaced from and extending generally longitudinally of and parallel to said first absorber and having a fluid passage in heat conducting relationship therewith, said second tube absorber not being in direct heat conducting relationship with said first generally flat absorber throughout the longitude thereof and not having any absorber plates in direct heat conducting relationship therewith, means both focusing a plurality of direct rays of solar radiation generally radially directly onto both sides of only said second absorber generally coincident with the axis thereof and directing a plurality of diffused rays of solar radiation onto the absorbing faces on both sides of said first absorber when the collector assembly is tracking the sun, and conduit means interconnecting said fluid passages such

that a fluid circulated through said passages is first heated by solar energy as it passes through said fluid passage of said first



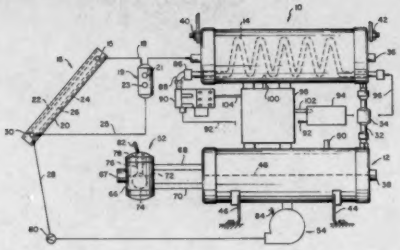
absorber and then is further heated by solar energy as it passes through said fluid passage of said second absorber.

4,220,137
SOLAR ENERGY COLLECTING SYSTEM
Allen R. Tesch, 823 Lake Amy Belle, and Scott T. Tesch, both of 823 Lake Amy Belle, Hubertus, Wis. 53033
Filed Sep. 18, 1978, Ser. No. 943,238
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—425 **17 Claims**



1. A solar energy collecting system comprising two sets of solar ray reflective louvers installed in a window opening of a building, a first set of said louvers being mounted vertically and the second set of said louvers being mounted horizontally, a solar energy collector located generally adjacent but spaced apart from said window opening, control means for moving said louvers to compensate for changes in sun position and resulting changes in the incident angle at which solar rays impinge upon said louvers, one set of said louvers being arranged and controlled by said control means for reflecting incident solar rays to said other set of louvers, and said other set of louvers being arranged and controlled by said control means for reflecting and focusing solar rays reflected thereon to said solar energy collector.

4,220,138
REFRIGERANT CHARGED SOLAR HEATING STRUCTURE AND SYSTEM
Edward W. Bottum, 9357 Spencer Rd., Brighton, Mich. 48116
Filed Jan. 24, 1978, Ser. No. 871,779
Int. Cl.² F24J *3/02*
U.S. Cl. 126—433 **8 Claims**



1. A closed solar heating system comprising a solar collector structure, heat dissipating structure, a vessel and means for circulating a refrigerant heat transfer medium in gaseous form from the collector structure to the heat dissipating structure and in liquid form from the heat dissipating structure to the vessel and pump means for pumping liquid refrigerant from the vessel to the collector structure, all connected together in operative relationship, and a refrigerant heat transfer medium in said system, said solar collector being located to receive sun rays, said heat dissipating structure being effective to transfer heat to a heat receiving medium, control means for said pump means to activate the pump when liquid refrigerant in said vessel rises above a predetermined level and to de-activate said pump means when the liquid refrigerant in the vessel falls below a predetermined level and an accumulator vessel in said means for circulating a refrigerant heat transfer medium in gaseous form from the collector structure to the heat dissipating structure to remove any liquid entrained in the gaseous refrigerant heat transfer medium, and means for flowing said liquid back to the collector structure from said accumulator vessel.

4,220,139
SOLAR PANEL SHIELDING
James B. Ramsden, Unit 85, 655 Walkley Rd., Ottawa, Ontario, Canada (K1V 9P1)
Filed Sep. 15, 1978, Ser. No. 942,672
Int. Cl.² F24J *3/02*
U.S. Cl. 126—441 **10 Claims**

1. A solar energy collector comprising:
a frame;
a window transmissive to solar energy mounted in the frame;
a solar energy absorber mounted in the frame at a position spaced from the window; to receive solar energy transmitted through the window;
a plurality of vane elements extending across the frame between the window and the absorber, each element being substantially transmissive to solar energy and substantially absorptive of thermal energy; and
means for moving the vane elements between a heat trapping position in which each vane element extends substantially from the window to the absorber, and a shielding position in which the vane elements overlap when projected upon the plane of the absorber and the window, the major axis of said vane elements being substantially parallel in both the heat trapping and heat shielding positions such that substantially all of the solar energy transmitted through the window must pass through plural vane elements to reach the absorber, thereby the amount of radiation reaching the absorber is significantly reduced.

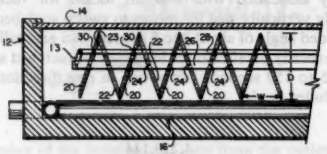
9. A solar energy collector comprising:

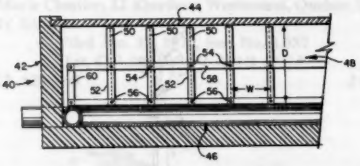
a frame;

a window transmissive to solar energy mounted in the frame;

a solar energy absorber mounted in the frame at a position spaced from the window, to receive solar energy transmitted through the window;

a plurality of substantially flat vane elements extending across the frame between the window and the absorber, each element being substantially transmissive to solar energy and substantially absorptive of thermal energy; and





means for moving the vane elements between a heat trapping position in which each vane element extends substantially from the window to the absorber and engages the adjacent vane elements along its respective edges to define a pair of oppositely opening, substantially V-shaped channels extending across the frame, and a shielding position in which the vane elements overlap when projected upon the plane of the absorber and the window such that solar energy transmitted through the window must pass through plural vane elements to reach the absorber, thereby the amount of radiation reaching the absorber is significantly reduced.

4,220,140

SOLAR RECEIVER

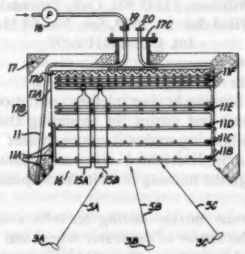
Giovanni Francia, Via Casaregis 34/12, Genoa, Italy

Continuation-in-part of Ser. No. 629,674, Nov. 6, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,856

Claims priority, application Italy, Nov. 22, 1974, 13055 A/74

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—446 **7 Claims**



1. A solar receiver having one or more pipes suitable to be passed through by a fluid to be heated, i.e. suitable for circulating said fluid inside said pipe or pipes to a prefixed direction, a casing having an opening, said pipe or pipes being arranged and supported within said casing provided with said opening shaped and directed in such a way as to collect incident solar energy said casing being for the remaining portion, closed and thermally insulated, wherein said pipe or pipes are substantially arranged in layers parallel to the plane of the casing opening through which the solar energy passes, and the fluid to be heated flows through the pipes in the first layer and then on the next ones above going upwards from the plane of the casing opening, so that the pipe portions passed through by the fluid at higher temperatures are shaded by the pipe portions passed through by the fluid at lower temperatures and the solar energy flux incident on the pipe portions passed through by the fluid at higher temperature does not exceed a previously stated limit value, the pipe or pipes passed through by the fluid to be heated having substantially triangular section wings or ribs having on their outer edge an acute angle, said wings or ribs having the outer surface polished so that the portion of the not absorbed incident solar energy which is diffused becomes neglectable, and being so oriented that the not absorbed incident solar energy is reflected to a direction such as to meet other pipes.

4,220,141

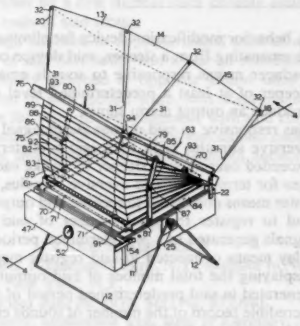
PORTABLE SOLAR COOKER

Lee V. Way, Jr., Rt. 8, Box 201, Sumter, S.C. 29150

Filed Sep. 21, 1978, Ser. No. 944,511

Int. Cl.[3] F24J *3/02*

U.S. Cl. 126—451 **5 Claims**



1. A portable solar oven comprising:

(a) an insulating housing having a base member and front and rear wall portions and opposed side wall portions extending outwardly therefrom and defining an opening in the side of said housing opposite said base member;

(b) a solar energy trapping shield member extending between said wall portions parallel to said base member and covering the opening defined thereby;

(c) an oven compartment enclosed within the lower portion of said housing and positioned in spaced relation to said energy trapping shield member, with said oven compartment being provided with a means for access into the interior thereof;

(d) a light reflecting assembly positioned on the wall portions of said housing adjacent to the edges of said energy trapping shield member and adapted to direct solar radiation impinging thereon to said shield member, said light reflecting assembly comprising:

(i) a rectangular frame member having one side pivotally connected to the rear wall of said housing;

(ii) a plurality of light reflecting panels removably mounted on the upper periphery of said frame member and angled outwardly therefrom;

(iii) an extensible and collapsible U-shaped wall structure

having an upper end connected to the underside of said frame member, a lower end connected to said housing and surrounding said plate and comprised of U-shaped strips of a reflecting material linked together in an overlapping telescoping arrangement such that the raising of said frame member causes the wall to become extended and when lowered the wall is caused to collapse; and

(iv) means for securing said frame member in the desired raised position.

4,220,142

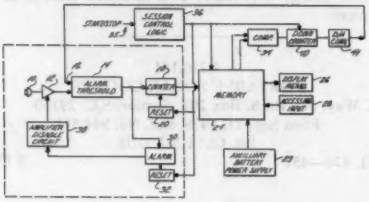
BEHAVIORAL SHAPING DEVICE FOR ELIMINATING NOCTURNAL SOUNDS

Raymond C. Rosen, both of 846 Hoes La., Piscataway, N.J. 08854; Linda J. Rosen, Piscataway, and Zoltan L. Sisko, Middlebush, N.J., assignors to Raymond C. Rosen and Linda J. Rosen, both of Piscataway, N.J.

Filed Sep. 1, 1977, Ser. No. 829,969

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **14 Claims**



1. A behavior modification device for eliminating nocturnal sounds emanating from a sleeper, said device comprising:

transducer means responsive to sounds emanating from a sleeper of at least a predetermined level of loudness to produce an output alarm signal,

means responsive to said output alarm signal for producing aversive stimulus each time said predetermined level is exceeded causing said sleeper to awake each such time,

means for terminating said aversive stimulus,

register means connected to receive said output alarm signal and to register the total number of said output alarm signals generated in a predetermined period of time, and

display means connected to said register means for visibly displaying the total number of said output alarm signals generated in said predetermined period of time, whereby a credible record of the number of sounds emanating from said sleeper is established.

4,220,143

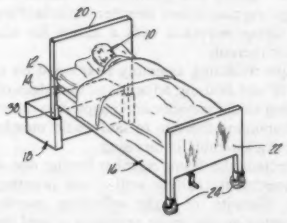
THERAPEUTIC APPARATUS

James M. Cummins, 3334 Parker, and Gilbert E. Pierfelice, 25130 Marshall, both of Dearborn, Mich. 48124

Filed Mar. 31, 1978, Ser. No. 892,393

Int. Cl.[3] A61H *1/00*

U.S. Cl. 128—33 **11 Claims**



1. A machine for imparting an oscillating motion to a bed and the body of a patient who remains in essentially one position for a prolonged period of time on a generally horizontally extending surface of the bed which underlies the body of the patient and supports the weight thereof by bearing on portions of the skin of the patient, the machine comprising a frame, lift means carried by said frame and constructed and arranged to engage one end of the bed for alternately raising and lowering such one end of the bed to impart an oscillatory movement thereto, and drive means including at least one lead screw operably associated with said lift means for reciprocating generally vertically said lift means to sweep such bed through an included angle of about 2 to 6 degrees in a generally vertical plane generally parallel to the longitude of such bed at a rate of about 15 to 150 seconds per sweep in one direction through said included angle.

4,220,144

ORAL HYGIENE DEVICE

Marcelino P. Balais, 2550 N. Fairhill St., Philadelphia, Pa. 19133

Filed Dec. 15, 1978, Ser. No. 969,779

Int. Cl.[3] A61H *7/00*

U.S. Cl. 128—62 A **7 Claims**

1. An oral hygiene device, comprising:

(a) a longitudinally extended toothbrush having bristles secured to a first end section thereof; and,

(b) a gingivae massage element secured to a second end section of said longitudinally extended toothbrush, said massage element substantially defining a chordal segment of a cylindrical contour having an arcuate contour outer surface for compressive interface with the gingivae of a user and a planar chordal surface secured to said second end section of said toothbrush, said gingivae massage element being adhesively bonded to said second end section of said toothbrush throughout said planar chordal surface of said massage element.

4,220,145

HYDROTHERAPY APPARATUS

Roger A. Stamp, 4323 NE. 20th, Portland, Oreg. 97211, and Farrell D. Williams, 21545 SE. Oak, Troutdale, Oreg. 97060

Filed Jul. 16, 1979, Ser. No. 58,114

Int. Cl.[2] A61H *9/00*

U.S. Cl. 128—66 **11 Claims**

1. A hydrotherapy apparatus comprising:

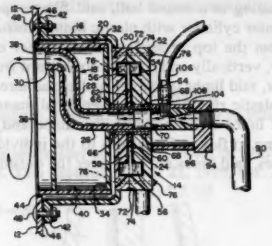
an impeller housing having inlet and outlet openings;

a water wheel and means for mounting the water wheel within the housing so that it can be rotated by pressurized water, at a predetermined minimum pressure level, flowing through the housing from its inlet opening to its outlet opening;

a single tubular nozzle having an inlet extending axially through the center of the water wheel and an outlet radially spaced from the center of the water wheel;

means for rigidly securing the nozzle inlet to the water wheel so that rotation of the water wheel will rotate the nozzle outlet through a circular path; and

conduit means for supplying water, at a pressure equal to or greater than the predetermined minimum level, to the inlet



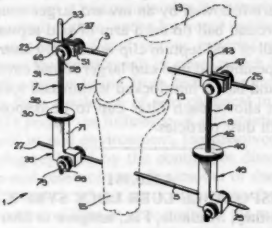
opening of the housing and then from the outlet opening of the housing to the nozzle inlet so that the water will be discharged from the nozzle outlet as it rotates.

4,220,146

BIPLANAR JOINT DISTRACTOR

Jean-Marie Cloutier, 12 Aberdeen, Westmount, Quebec, Canada (H3Y 3A4)

Filed Jan. 18, 1979, Ser. No. 4,557
Int. Cl.³ A61F *5/00*; A61B *17/18*
U.S. Cl. 128—69 **2 Claims**



1. A biplanar joint distractor to be used in arthroplasty for reversibly separating two articulated bones joined by at least one ligament while preserving the latter, said joint distractor comprising a pair of pins each to be removably introduced transversaly through one of the bones to be separated and a pair of mechanically adjustable means fixable onto said pins at a predetermined distance on both sides of the bones for forcing said bones apart, said adjustable means comprising:

a pair of at least partially threaded rods extending generally perpendicular to said pins, first means for rigidly fixing each rod by one of its ends to one end of one of said pins, said first means comprising a U-shaped member with two parallel arms defining a slot in which is inserted the upper end of one of the rods, a first, partially threaded fixing pin passing through and extending outwards the surfaces of both of the arms in a direction perpendicular to the axis of the slot, said first fixing pin comprising a first, external, not threaded portion with a transversal hole in which is inserted the end of one of the pin and a second, external, threaded portion, and a first serrated wheel threaded onto the second portion of said first fixing pin, whereby rotation of said first serrated wheel downwards onto said first fixing pin allows for simultaneous clamping of said one pin by contact against the surface of one of said arms and of said one rod by contraction of said arms,

second means slidably mounted on each of said rods, including means thereon for clamping the ends of the other pin; and

a pair of operating wheels each threadably mounted on the threaded portion of one of said rods between said first and second means,

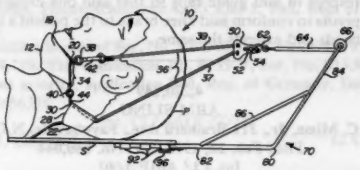
whereby rotation of said operating wheels in one direction brings said operating wheels in contact against said second means and forces the latter to slide along the rods apart from the first means while rotation of said wheels in the other direction lets said second means freely slide back along the rods towards the first means.

4,220,147

PARTIALLY DISASSEMBLABLE TRACTION SLING

Ralph S. Allen, III, 30003 Arena Dr., Evergreen, Colo. 80439

Filed Dec. 5, 1977, Ser. No. 857,788
Int. Cl.² A61H *1/02*
U.S. Cl. 128—75 **9 Claims**



1. Traction sling apparatus, comprising:

two wide, elongated flexible straps, each said strap having a first end and a second end, the first of said straps being permanently but loosely fastened together with the second of said straps in roughly parallel spaced-apart relation to each other by a first flexible cord slidably attached to said first ends of said straps;

a pair of rings attached to opposite lateral sides of said second end of said first strap, and a pair of releasable hook means loosely attached to opposite lateral sides of said second end of said second strap, said hook means being adaptable for releasable engagement with said rings; and

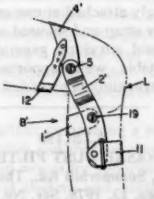
hanger means connected to said first and second ends of said straps for suspending said straps from an anchoring device.

4,220,148

KNEE STABILIZER

Hans R. Lehneis, Massapequa Park, N.Y., assignor to New York University, New York, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,640
Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2705978
Int. Cl.² A61F *3/00, 15/00*
U.S. Cl. 128—80 C **13 Claims**



1. A brace for application on a patient's leg in a predetermined worn position to stabilize the knee joint and prevent knee strain while permitting normal movement of the leg, comprising:

a pair of substantially rigid, opposed guide rail means, each having an upper and lower end, for extending substantially above and below the patient's knee joint on either side of the leg;

a substantially rigid upper cross-member mounted near the upper end of each guide rail and positioned to extend across and engage the front of the patient's leg at a point above the knee joint;

a medial cross-member mounted to each of said guide rails below said upper cross-member and positioned to extend across and engage the rear of the patient's leg in the vicinity of the knee joint for providing a forwardly directed supporting force therefor; and

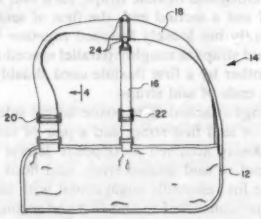
an inelastic lower cross-member mounted to each of said guide rails near the lower end thereof and positioned to extend across and engage the front of the patient's leg at a point below the knee joint;

at least one of said cross-members being at least partially detachable to permit application and removal of the knee brace on the patient's leg, one of said upper and medial cross-members being mounted for pivotal movement with respect to said guide rails so that said one cross-member pivots to conform said knee brace to the patient's leg as he bends and extends the same.

4,220,149
ARM SLING

Carl C. Mims, Jr., 311 Brainard Ave., Fayetteville, N.C. 28301

Filed Feb. 22, 1978, Ser. No. 880,044
Int. Cl.[2] A61F *5/40*
U.S. Cl. 128—94 **7 Claims**



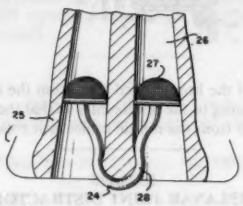
1. An improved arm sling for a wearer thereof comprising: an arm support envelope having an upper and lower portion and two end portions as disposed when the wearer thereof is in a generally upright position, one of said ends being disposed adjacent the elbow of said wearer and at least a portion of the upper edge adjoining said elbow and forearm of said wearer inside the cavity formed by said envelope; a first forearm portion in the form of a unitary shoulder strap secured to and extending from the upper elbow end portion of said envelope, over the shoulder and around the neck of the wearer thereof, and adjustably secured at its other end to the upper end portion of said envelope opposite said elbow end; and a second harness portion in the form of a disconnectable, length adjustable forearm strap slidingly attached at one end to the central portion of said shoulder strap and secured at its other end to the upper portion of said envelope generally midway its ends whereby a comfortable, well supported and yet simple to adorn and remove arm sling is provided.

4,220,150
NASAL DUST FILTER

John R. King, Rt. 1, Summerhill Rd., Thomasville, Ga. 31792

Filed Sep. 13, 1978, Ser. No. 941,954
Int. Cl.[3] A61M *15/08*
U.S. Cl. 128—206.11 **2 Claims**

1. A nasal dust filter device adapted to be inserted within the nasal passages of the nose, comprising a pair of umbrellalike structural filter cups, each having an open base and a clad outer side, each open base faces downward, said umbrellalike filter cup structure is formed from non-allergenic flexible plastics, a septum bridge clip formed vertically U-shaped for clipping around the septum with arms formed to apply tension on the septum cartilage walls, said arms extend vertically upward angling at a slight degree outwardly thereby adapted to be positioned toward the center of each nasal passage, said arms each terminating in a round ball, said filter cups including a common center cylinder with plastic limbs protruding radially outward from the top of said common center cylinder both horizontally, vertically and equally downward from the top of said cylinder, said limbs terminate and are adhered to a rubber or flexible plastic ring by any conventional manner, said ring secures said limbs in an umbrellalike shape and enables said limbs and ring to flex and conform to the individual wearer's nasal passages, said limbs are clad over the outside with a thin

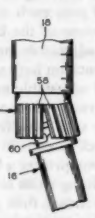


non-allergenic porous filtering material, said filtering material is adhered to the limbs by any conventional manner suitable, said cylinder extends downwardly from a common center of said limbs and terminates in a horizontally disposed flat base, said base includes a socket aperture cavity comprised of an access aperture followed by an inward larger round cavity to receive said round ball on each arm of said septum clip, each said round ball of said septum clip removably inserted through said access opening and into said larger round cavity, whereby each said round ball is interlocked within said socket aperture cavity which allows each filter cup to be disposed of when saturated with dust particles.

4,220,151
DISPOSABLE LUER LOCK SYRINGE

Edgar H. Whitney, Seminole, Fla., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Sep. 20, 1978, Ser. No. 944,225
Int. Cl.[3] A61M *5/00*
U.S. Cl. 128—218 N **29 Claims**



1. A disposable Luer lock syringe comprising a syringe barrel adapted to receive a syringe piston, said barrel including a plastic Luer tapered connector connected thereto at the distal end thereof for receiving a coupling element of a device adapted for fluid communication with said barrel, a plastic fracturable portion connected to said connector and spaced proximally of the distal end of said connector, and a plastic Luer lock collar connected to said barrel and surrounding said connector and having thread means thereon adapted to threadedly engage portions of the coupling element when the coupling element is received by said connector, said collar having a plurality of circumferentially disposed generally axially extending grooves each having a bottom wall with weak portions

of less thickness than the depth of the groove so that weak portions of said collar and said connector can be bent sufficiently to fracture said fracturable portion and prevent effective reuse of the syringe.

4,220,152

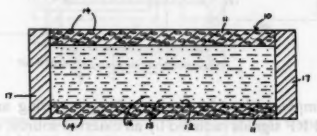
DELIVERY SYSTEM

David S. Dresback, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 904,078, May 8, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 14,387

Int. Cl.[3] A61M *5/00*

U.S. Cl. 128—260 38 Claims



1. A device for the controlled and continuous administration of a chemical to an aqueous liquid-containing environment over a prolonged period of time, said device comprising a reservoir containing said chemical, a shaped wall formed in part at least of a porous material, said porous material being in contact with at least a part of said reservoir and being insoluble in said environment while maintaining its integrity during said prolonged period of time, and a hydrogel medium means impregnating the pores of said porous material, said hydrogel medium means having channels or pores which (1) permit the diffusion of aqueous liquid from said environment into said reservoir to form a solution of said chemical in said aqueous liquid and (2) permit the diffusion of said solution containing said chemical to said environment, the dissolved chemical so released being replaced by the continuous dissolving of said chemical in said reservoir and the amount of dissolved chemical in said reservoir changing continuously throughout said prolonged period of time so as to maintain the rate of chemical release to said environment substantially constant during a substantial portion of said prolonged period of time.

4,220,153

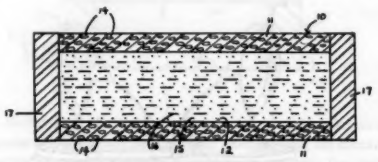
CONTROLLED RELEASE DELIVERY SYSTEM

David S. Dresback, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 904,049, May 8, 1978, abandoned. This application Feb. 22, 1979, Ser. No. 14,388

Int. Cl.[2] A61M *7/00*

U.S. Cl. 128—260 38 Claims



1. A device for the controlled and continuous administration of a chemical to an aqueous liquid-containing environment over a prolonged period of time, said device comprising a reservoir containing said chemical, a shaped wall formed in part at least of a porous fabric material, said porous fabric material being in contact with at least a part of said reservoir and being insoluble in said environment while maintaining its integrity during said prolonged period of time, and a hydrogel medium means impregnating the pores of said porous fabric material, said hydrogel medium means having channels or pores which (1) permit the diffusion of aqueous liquid from said environment into said reservoir to form a solution of said chemical in said aqueous liquid and (2) permit the diffusion of said solution containing said chemical to said environment, the dissolved chemical so released being replaced by the continuous dissolving of said chemical in said reservoir and the amount of dissolved chemical in said reservoir changing continuously throughout said prolonged period of time so as to maintain the rate of chemical release to said environment substantially constant during a substantial portion of said prolonged period of time.

4,220,154

DEVICE FOR COAGULATING BIOLOGICAL TISSUE

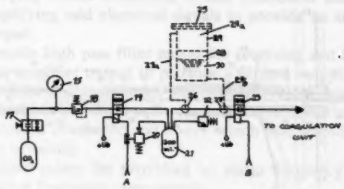
Kurt Semm, Hegewischstrasse 4, 23 Kiel 1, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 699,305, Jun. 24, 1976, Pat. No. 4,074,719. This application Jul. 8, 1977, Ser. No. 813,803

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656278

Int. Cl.[2] A61B *17/38*

U.S. Cl. 128—303.1 13 Claims



1. In a device for coagulating biological tissue, a combination comprising

first means, including a portion engageable with the tissue, for heating and thereby coagulating the tissue:

second means, including a source of cooling fluid, for thereafter conducting cooling fluid from said source to said portion and to the coagulated tissue, so as to cool said portion sufficiently to avoid undesirable influences should said portion come into contact with non-coagulated tissue upon removal from the coagulated tissue, said source comprising a pressurized container including a charge of said cooling fluid in form of a compressed gaseous fluid, a metering receptacle connected with said container and adapted to contain a metered amount of said fluid, an electromagnetic filling valve for admitting said fluid from said container into said receptacle, and means for closing said filling valve when the pressure of fluid in said receptacle reaches a predetermined value

said first means comprising a coagulation instrument, said portion constituting a leading end portion of the instrument and the instrument further having a trailing end portion and an intermediate portion which connects said end portions;

said first means further comprising a mount secured to said trailing end portion and thermal energy supplying means connected to said mount for supplying thermal energy via the same to said leading end portion, and said second means also being connected to said mount;

said first mentioned portion further comprising a stationary and a movable jaw,

said intermediate portion comprising a tube and said trailing end portion comprising a control rod for said movable jaw extending slidably through said tube and connected to said movable jaw,

said mount including a journal which slidably receives a portion of said control rod;

said source of cooling fluid further comprising a nipple on

said mount and communicating with the interior of said tube, and

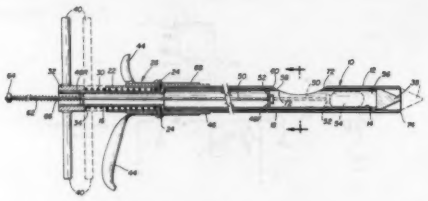
a conduit connecting said source with said nipple so that cooling fluid from said source travels via said tube to said stationary and movable jaws.

4,220,155

APPARATUS FOR SPAYING LARGE ANIMALS

Cleon V. Kimberling, and Gary P. Rupp, both of Fort Collins, Colo., assignors to Colorado State University Research Foundation, Fort Collins, Colo.

Filed May 11, 1978, Ser. No. 904,982
Int. Cl.[2] A61B 17/32
U.S. Cl. 128—306 **4 Claims**



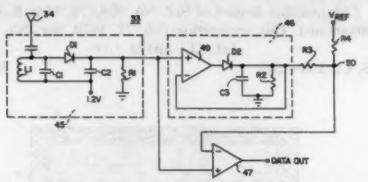
1. The surgical tool for excising the ovaries from large animals which comprises: an outer tubular member having an ovary-receiving opening in the wall thereof bordered by a sharpened inside edge, an inner tubular element telescoped within the outer tubular element cooperating therewith to define a close sliding fit for both relative axial and rotational movement, said inner tubular element terminating at one end in a point effective to puncture the wall of the animal's abdominal cavity, said inner tubular element having an ovary-receiving opening in the wall thereof bordered by a sharpened edge positioned and adapted to cooperate in aligned position with the sharpened edge of the opening in the outer tubular element upon relative movement therebetween to cut an ovary housed within the inner tubular element free of its connecting tissue, and said ovary-receiving opening of the inner tubular element being spaced from said point thereof a distance effective to leave a storage compartment therebetween of a size to house an excised ovary, first handle-forming means depending from the end of the inner tubular element opposite said pointed end thereof, said first handle-forming means being accessible beyond the adjacent end of the outer tubular element and adapted for use in reciprocating said inner tubular element between an extended position with its pointed end exposed beyond the corresponding end of said ouer tubular element and a retracted position withdrawn inside the latter, and said first handle-forming means also providing means for rotating the inner tubular element within said outer tubular element while the latter is held stationary, and a pushrod mounted for relative reciprocating movement within the inner tubular element between a retracted position on the opposite side of the ovary-receiving opening therein from the pointed end thereof and an extended position on the same side thereof, said pushrod being accessible from said opposite end of the inner tubular element and effective upon actuation with an excised ovary inside the latter to push same into said storage compartment.

4,220,156

LOW POWER IMPLANTABLE APPARATUS AND METHOD FOR RECEIVING AN AM SIGNAL

Joseph H. Schulman, Los Angeles, and Wayne A. Morgan, Granada Hills, both of Calif., assignors to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Nov. 3, 1978, Ser. No. 957,440
Int. Cl.[3] A61N 1/00
U.S. Cl. 128—419 R **11 Claims**



1. An implantable AM receiver for processing amplitude modulated RF signals radiated by an external source, comprising:

detection means for providing a modulation envelope of received RF signals comprising said radiated amplitude modulated RF signals;

generation means for developing a variable threshold signal having a value substantially equal to a predetermined percentage of said modulation envelope if said threshold signal is lower than said modulation envelope and a value decreasing in accordance with a predetermined decay profile if said threshold signal is higher than said modulation envelope but not less than a predetermined minimum level; and

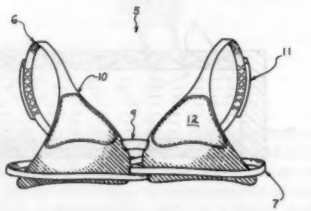
output means for providing an output signal having a first voltage state when said modulation level is greater than said threshold signal and a second voltage state when said modulation envelope is less than said threshold signal.

4,220,157

COUNTERWEIGHTED BRASSIERE FOR ATHLETIC USE

Harold E. Clark, Rte. 3, Box 136, Hendersonville, N.C. 28739, and Paul T. Clarl, 70 Huron Ave., Cambridge, Mass. 02138

Filed Nov. 28, 1978, Ser. No. 964,277
Int. Cl.[2] A41C 3/00
U.S. Cl. 128—510 **10 Claims**



1. A brassiere in which the support for the breasts comprises

a pair of cups,

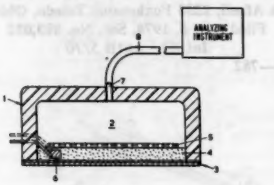
a pair of straps each attached to one of said cups and passing over a shoulder of the wearer, and

a pair of weights each of which approximates the weight of a breast and is attached to a respective one of said straps at a point over the shoulder on the back of the wearer.

4,220,158
TRANSCUTANEOUS PROBE

David T. Delpy, and Dawood Parker, both of London, England, assignors to The Medishield Corporation Limited, London, England

Filed Nov. 14, 1978, Ser. No. 960,703
Claims priority, application United Kingdom, Nov. 15, 1977, 47434/77; May 31, 1978, 25028/78
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—632 2 Claims

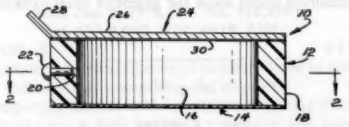


1. A transcutaneous probe for measuring gas concentration in arterial blood including a body defining a gas collecting chamber, one wall portion of said chamber defined by a porous member and a composite membrane supported thereby, said composite membrane having a first layer constituted by a gas-permeable plastics film and a second layer constituted by a perforated metal film, the size and distribution of the perforations in the perforated metal film being such that the wall has a substantially uniform extrinsic macropermeability which is significantly lower than the inherent permeability of the first layer alone and that in use, gas passes into the perforations of said second layer from respective volumes of tissue which do not substantially overlap, each perforation in the perforated metal film having a frustoconical form, and the gas permeable plastics film being in intimate contact with the face of the perforated metal film which bears the smaller diameter ends of said perforations to prevent the first and second layers from separating from each other.

4,220,159
ELECTRODE

Howard T. Francis, Park Forest; Robert J. Abele, Northbrook, and Kenneth E. Pawlak, Mundelein, all of Ill., assignors to Biomedical International Company, River Grove, Ill.

Continuation-in-part of Ser. No. 249,135, May 1, 1972, abandoned. This application Apr. 23, 1976, Ser. No. 679,656
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—639 15 Claims

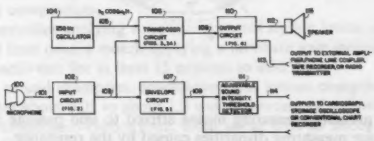


1. A biomedical electrode for use on a subject to take electrical measurements from said subject comprising, an electrical conductor adapted for connection to an instrument for making electrical measurements, a solid metal electrically connected to the electrical conductor, a liquid ionic solution in contact with the solid metal, means for holding the ionic solution in contact with the solid metal, said means including a container having an aperture with a porous phase separator permeable by said ionic solution mounted across said aperture to retain the ionic solution, said porous phase separator having one side contacting the ionic solution and the other side being wetted by the ionic solution and being adapted for direct contact with a surface of the subject for ionic conduction between the surface and the ionic solution through the phase separator.

4,220,160
METHOD AND APPARATUS FOR DISCRIMINATION AND DETECTION OF HEART SOUNDS

John P. Kimball, and Cesar A. Caceres, both of Washington, D.C., assignors to Clinical Systems Associates, Inc., Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,172
Int. Cl.[2] A61B 7/04
U.S. Cl. 128—715 14 Claims



1. Apparatus for improving aural and visual discrimination and detection of heart sounds comprising:

a transducer means for converting said heart sounds to electrical signals,

amplifying means connected to said transducer means for amplifying said electrical signals to provide an amplifier output,

adjustable high pass filter means for receiving and filtering said amplifier output to produce a filtered output having frequency components, wherein said high pass filter means has a cutoff frequency, below which said amplifier output is attenuated and above which said amplifier output is passed,

oscillator means for providing an audio frequency carrier having frequency components,

modulator means connected to said adjustable filter means and to said oscillator means for modulating said audio frequency carrier with said filtered output so as to generate a modulator output representing a sum and a difference of said frequency components of said filtered output and said audio frequency carrier,

high pass filter means connected to said modulator means for filtering said modulator output to produce a further filtered signal representing the sum of said frequency components of said filtered output and said audio frequency carrier, and

sound intensity discriminating means connected to said adjustable high pass filter means for producing a visual display of said filtered output, whereby to provide visual detection and discrimination of inaudible heart sound events.

4,220,161
PERTURBATION DEVICE FOR THE MEASUREMENT OF AIRWAY RESISTANCE

Howard M. Berlin, 2 Colony Blvd., Apt. 123, Wilmington, Del. 19802, and Arthur T. Johnson, R.D. 2, Box 32, Darlington, Md. 21034

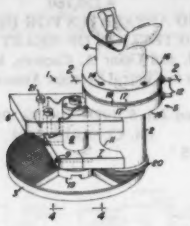
Filed Apr. 18, 1975, Ser. No. 569,345
Int. Cl.[3] A61B 5/08
U.S. Cl. 128—720 5 Claims

1. An airway resistance measuring device for animals comprising:

an air passage means providing air passage for an air stream from the animal to the atmosphere;

a cyclic perturber means affixed to said passage means for cyclically imposing a resistance to said air stream comprising a sectored member traversing said passage means on one end thereof and said sectored member having at least one sector with a large void and at least one sector having plural small voids, and a drive means affixed to said pas-

sage means for driving said sectored member to alternately impose said sectors across said passage means; and



pressure measuring means affixed to said passage means for measuring disparities caused by the resistance.

4,220,162

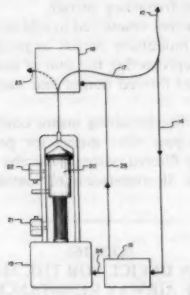
ALVEOLAR GAS SAMPLING SYSTEM AND METHOD

Justin S. Clark, and Frederick L. Farr, both of Salt Lake City, Utah, assignors to Intermountain Health Care

Continuation-in-part of Ser. No. 636,357, Dec. 1, 1975, abandoned. This application Nov. 24, 1978, Ser. No. 963,393

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—724 **4 Claims**



1. In a system for sampling alveolar gas exhaled from a subject comprising a non-invasive catheter, signal means for detecting the inspiratory and expiratory phases of the respiratory cycle attached to one end of the catheter, controller means connected with the signal means and valve means located at the other end of the catheter said valve means also being signally connected to and operated by the controller the improvement which comprises (a) a reversible stepper motor connected to and operated by the controller and (b) a positive displacement pump having a pump chamber operated by said stepper motor and connected to said valve means such that alveolar gas may be directly drawn into the pump chamber of said positive displacement pump through said catheter and valve means when the stepper motor is operated in one direction by the controller and discharged from said positive displacement pump chamber through said valve means when the stepper motor is operated in the opposite direction by the controller.

4,220,163

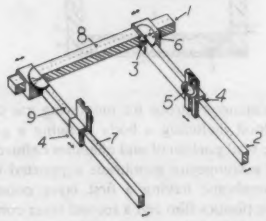
TIBIAL TORSION MEASURING DEVICE

Saeed Malek Afzali, 2233 Foxbourne, Toledo, Ohio 43614

Filed Apr. 3, 1978, Ser. No. 893,052

Int. Cl.² A61B *5/10*

U.S. Cl. 128—782 **1 Claim**



1. A device for measuring tibial torsion comprising a supportive member having attached thereto on moveable hinged supports at least two hinged members, said hinged members having thereon angle-measuring scales to show the angle between said hinged members and said supportive member, said hinged members having adjustably attached to each at least one positionable cup like structure for placement over the malleoli, said cup like structures to be fastened to said hinged members so that one of the cup like structures can be positioned over the malleoli when said supportive member is placed behind a patient's heel and the respective hinged member is at 90° to said supportive member, said hinged member having on each similar distance scales to ascertain the position of said cup like structure on said hinged member relative to said supportive member, further, the similar distance scales placed to allow the second cup like structure to be positioned precisely the same distance from said supportive member, further, when both said cup like structures are positioned the same distance from said supportive member when said hinged members are 90° to a said supportive member, and said cup like structures are then placed over a patient's malleoli without changing their respective positions on said hinged members, said measuring scales show the extent of tibial torsion.

4,220,164

TOBACCO DISTRIBUTOR FOR CIGARETTE ROD MAKING MACHINES OR THE LIKE

Heinz-Christen Lorenzen, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed May 10, 1977, Ser. No. 795,559

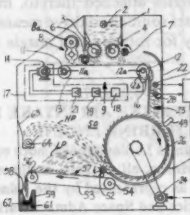
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621410

Int. Cl.² A24C *1/02, 5/39*

U.S. Cl. 131—84 R **7 Claims**

1. In an apparatus for forming a continuous layer of tobacco particles in a machine for the production of cigarettes or the like, the combination of a receptacle; means for supplying

tobacco particles into said receptacle at a substantially constant rate per weight including a weighing device and means for feeding tobacco particles to said weighing device, said weighing device including a conveyor arranged to deliver to said receptacle equal quantities per weight of tobacco particles per unit of time and means for varying the speed of said conveyor



as a function of changes in the rate of tobacco feed; adjustable means for evacuating tobacco particles from said receptacle; means for monitoring the volume of the supply of tobacco particles in said receptacle; and means for adjusting said evacuating means when the monitored volume of the supply of particles in said receptacle deviates from a predetermined range.

4,220,165

Patent Not Issued For This Number

4,220,166

METHOD OF RESTORING NORMAL MOISTURE LEVEL TO HAIR WITH SEVERE MOISTURE DEFICIENCY

Gerald P. Newell, Hanover Park, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,359

Int. Cl.[2] A45D *7/04;* A61K *7/06*

U.S. Cl. 132—7 **4 Claims**

1. A method for restoring normal moisture level to severely moisture deficient hair comprising the steps of:

(1) shampooing the hair with a moisture stabilizing shampoo;

(2) at least once a week applying a moisture gain intensive conditioner for at least 25 minutes to said freshly shampooed hair;

(3) at least once a week, applying a moisture gain deep heat treatment to said freshly shampooed hair;

(4) conditioning the shampooed hair with a moisture stabilizing composition when said deep heat treatment or said moisture gain intensive treatment is not used; and

(5) thereafter applying a moisture control styling lotion; each of said shampoos, conditioners and lotions comprising from about 0.01 to about 1.0 weight percent of sodium-2-pyrrolidone-5-carboxylate, from about 0.01 to about 5.0 weight percent of glycerin and from about 0.01 to about 5.0 weight percent of protein derived from a collagenous source.

4,220,167

METHOD OF RESTORING NORMAL MOISTURE LEVEL TO HAIR WITH SLIGHT TO MODERATE MOISTURE DEFICIENCY

Gerald P. Newell, Hanover Park, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,361

Int. Cl.[2] A45D *7/04;* A61K *7/06*

U.S. Cl. 132—7 **8 Claims**

1. A method for restoring normal moisture level to slight to moderately moisture deficient hair comprising the steps of:

(1) shampooing the hair with a moisture stabilizing shampoo;

(2) conditioning the shampooed hair with a moisture stabilizing composition;

(3) thereafter applying a moisture control styling lotion; and

(4) at least once a month applying a moisture gain intensive conditioner for at least 15 minutes to said hair;

each of said shampoos, conditioners and lotions comprising from about 0.01 to about 1.0 weight percent of sodium-2-pyrrolidone-5-carboxylate, from about 0.01 to about 5.0 weight percent of glycerin and from about 0.01 to about 5.0 weight percent of protein derived from a collagenous source.

4,220,168

METHOD OF MOISTURIZING AND MAINTAINING NORMAL MOISTURE LEVEL IN HAIR HAVING A NORMAL MOISTURE CONTENT

Gerald P. Newell, Hanover Park, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Jun. 5, 1978, Ser. No. 912,362

Int. Cl.[2] A45D *7/04;* A61K *7/06*

U.S. Cl. 132—7 **5 Claims**

1. A method for maintaining the normal moisture level of hair comprising the steps of:

(1) shampooing the hair with a moisture stabilizing shampoo;

(2) conditioning the shampooed hair with a moisture stabilizing composition;

(3) thereafter applying a moisture control styling lotion; each of said shampoos, conditioners and lotions comprising from about 0.01 to about 1.0 weight percent of 2-pyrrolidone-5-carboxylate or a salt thereof, from about 0.01 to about 5.0 weight percent of glycerin and from about 0.01 to about 5.0 weight percent of protein derived from a collagenous source.

4,220,169

APPARATUS IN A COIN PACKAGING MACHINE FOR TREATING COINS WHICH ARE ACCUMULATED OUT OF ALIGNMENT

Katusuke Furuya, Tokyo, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 946,032

Int. Cl.[2] G07D *9/06*

U.S. Cl. 133—8 A **1 Claim**

1. An apparatus in a coin packaging machine for treating coins which are accumulated in a cartridge out of alignment, comprising:

a reversible motor having forward and reverse directions of rotation,

a cam driving shaft capable of being connected with said reversible motor,

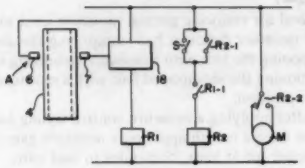
means for connecting said reversible motor to said cam driving shaft when a predetermined number of coins is

accumulated in the cartridge of the coin packaging machine,

a non-alignment detecting cam mounted on said cam driving shaft,

a switch actuated by said non-alignment detecting cam,

means for detecting non-alignment of the coins accumulated in the cartridge,



first circuit means for rotating said reversible motor in the reverse direction as non-alignment of the coins is detected and said switch is acutated, and for maintaining the reverse rotation of said reversible motor, and

second circuit means for rotating said motor in the forward direction as non-alignment of the coins is eliminated during the reverse rotation of said reversible motor.

4,220,170

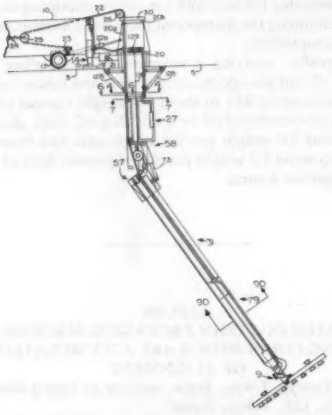
APPARATUS FOR CLEANING LARGE TANK INTERIORS

Chris J. Hebert; Ralph T. Hollister, both of 157 N. Leo, Baton Rouge, La. 70806, and C. Downing Sweat, Jr., 4627 Tartan Dr., Baton Rouge, La. 70816

Continuation-in-part of Ser. No. 36,439, May 7, 1979, which is a continuation-in-part of Ser. No. 851,342, Nov. 14, 1978, Pat. No. 4,163,455. This application Jul. 30, 1979, Ser. No. 62,041

Int. Cl.³ B08B *9/08, 3/02*

U.S. Cl. 134—167 R **9 Claims**



1. An apparatus for cleaning large tank interiors comprising:

(a) a boom housing unit connectable to a support means for rigidly fixing said boom housing unit in a position in said interior, said boom housing unit having a cage assembly containing controls for operating said apparatus, said cage assembly being rollingly supported on parallel, separated channel iron beams attached to said boom housing unit whereby said cage assembly can extend beyond said boom housing unit;

(b) a rotatable telescoping boom assembly comprising:

(i) a main boom extension shaped to be retractable into said boom housing unit by retracting means attached to said main boom extension and said boom housing unit, and

(ii) a lower boom extension retractably attached to said main boom extension and pivotedly mounted in an extended position to said main boom extension; and

(c) a nozzle assembly rotatably attached to said lower boom extension, said nozzle assembly comprising a nozzle manifold having nozzles attached thereto, means to connect nozzles to a water source and drive means attached to said nozzle assembly for rotating said nozzle manifold.

4,220,171

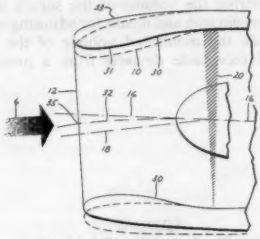
CURVED CENTERLINE AIR INTAKE FOR A GAS TURBINE ENGINE

William C. Ruehr; James L. Younghans, both of Cincinnati, and Edwin B. Smith, Mason, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 14, 1979, Ser. No. 38,980

Int. Cl.³ B64D *33/02*

U.S. Cl. 137—15.1 **7 Claims**



1. An improved gas turbine intake having a front face with a center displaced from an engine centerline, wherein the improvement comprises:

an internal surface contour based on a curved inlet centerline around which inlet interior surfaces are defined;

said inlet centerline having a curved upstream portion extending from the front face center downstream in a curve to a point at which the engine centerline is tangent to the inlet centerline; and

said internal surface contour being curved and defined as endpoints of radii extending from the curved inlet centerline, wherein said radii extend outwardly in a direction perpendicular to local centerline contour.

4,220,172

FIRE SAFE BUTTERFLY VALVE

Francis W. Stager, Stafford Springs, Conn., assignor to Litton Industrial Products, Inc., East Hartford, Conn.

Filed May 30, 1978, Ser. No. 910,604

Int. Cl.³ F16K *1/226*

U.S. Cl. 137—74 **2 Claims**

1. In a butterfly valve assembly operative at normal temperatures and at high temperatures for controlling fluid flow, the combination comprising:

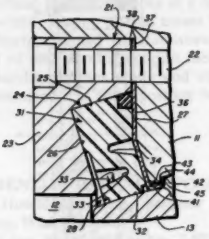
a movable valve member adapted to close said passageway,

sealing means for providing bidirectional sealing with said valve member, said sealing means comprising a resilient seating ring which is destructible at high temperatures and a metallic seating ring which is indestructible at high temperatures,

recess means for securing said seating rings in said valve body, said resilient and metallic seating rings extending into said passageway and forming two seating surfaces to

provide redundant sealing with said valve member at normal temperatures, and

ramp means in said passageway adjacent the opening to said recess in an interference fit with a turned back edge of said metallic seating ring to preload said metallic seating ring



against said valve member and to retain said metallic seating ring against pressure from either side of said valve member, whereby said metallic seating ring provides bidirectional sealing with said valve member at high temperatures sufficient to destroy said resilient seating ring.

4,220,173

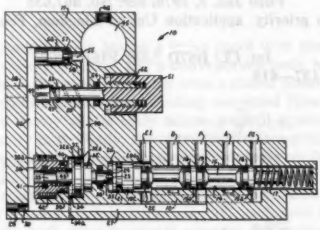
TIME DELAY FLUID VALVE

John W. O'Brien, 607 S. Kelly St., Harrison, Ark. 72601

Filed Jul. 31, 1978, Ser. No. 929,338

Int. Cl.³ F16K *31/122, 51/00*

U.S. Cl. 137—239 **15 Claims**



1. A time delay valve device for directing pressurized fluid to a load, said device comprising:

a valve body presenting a cavity therein for receiving pressurized fluid;

a valve member supported on said body for movement between first and second positions to control the flow of fluid to the load;

yieldable means urging said valve member toward the first position;

a piston slidably supported on said valve body;

a passage through said piston having an inlet end and an outlet end, said inlet end communicating with said cavity to receive fluid therefrom;

a fluid chamber in said valve body disposed to receive fluid from the outlet end of said passage, said valve member being shiftable from the first position to the second position in response to entry of fluid into said chamber directed against an end of the valve member and opposing the bias of the yieldable means;

means establishing a releasable seal for the outlet end of said passage to substantially block the flow of fluid into said chamber through said passage;

a reservoir in said valve body;

a metering passageway in said valve body providing communication between said cavity and reservoir, said passageway being restricted in size to meter fluid flow into said reservoir to delay the build up of pressure therein; and

a pressure surface of said piston against which fluid in said reservoir acts in a manner urging said piston to slide in a direction to break said releasable seal, whereby fluid flows through said passage into said chamber to shift said valve member to the second position after a time delay sufficient for the fluid pressure in said reservoir to build up to a predetermined level.

4,220,174

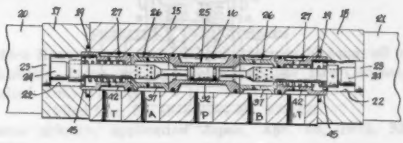
FLUID CONTROL VALVES

Russell W. Spitz, 6802 Tanglewood Rd., Boardman, Ohio 44512

Filed Mar. 29, 1978, Ser. No. 891,450

Int. Cl.³ F16K *11/07*

U.S. Cl. 137—271 **8 Claims**



1. A fluid control valve, comprising

a valve body having a bore and a port communicating with said bore,

a plurality of separators of comparable dimensions whereby any one may be inserted axially within said body bore for cooperation with said port,

each separator having an axial opening and an exterior surface configured to form an annular space with said body bore adjacent to said port when installed within said body bore, and each of said separators having radial port means for establishing fluid communication between its axial opening and said annular space,

a plunger adapted to reciprocate axially through the separator installed within said body bore and adapted to cooperate with its radial port means to control said fluid communication,

the disposition of said radial port means being different in each of said separators, whereby a selected one may be installed within said body bore to provide predetermined valving action.

5. In a fluid control valve including a body, a plunger reciprocable in a bore in the body of said valve, said plunger comprising,

a cylindrical bushing slidable axially within said bore to guide movement of said plunger, and a stem portion connected to an end of said cylindrical bushing to extend axially thereof,

said stem portion having a cylindrical head of a diameter substantially equal to the diameter of said bushing, and a cylindrical shoulder of reduced diameter bearing against said bushing end to space said head from said end to provide an annular groove, and a

ring-like seal disposed within said groove, the opening of said seal being substantially equal to the diameter of said shoulder and the outer diameter of said seal being substantially equal to the diameter of said bushing, said seal being seated within said groove free of any stress in the connection of said stem portion to said bushing,

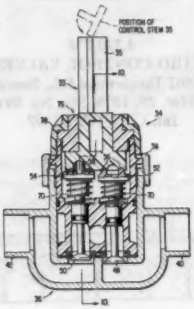
the foregoing construction providing for assembly of said seal with said plunger without undue stretching of the former, by assembiing said seal on said cylindrical shoulder prior to the time and stem portion is connected to said bushing.

4,220,175

ANTI-SCALD APPARATUS FOR A TUB AND SHOWER SINGLE CONTROL FAUCET

Robert J. Keller, III, Richmond, Va.; Brian G. Fox, Dover Center, and Benjamin A. Korec, Cambridge, both of Canada, assignors to Kel-Win Manufacturing Company, Inc., Chester, Va.

Filed May 15, 1978, Ser. No. 906,072
Int. Cl.[3] F16K *19/00*
U.S. Cl. 137—454.6 8 Claims



1. An anti-scald apparatus for a tub and shower single control faucet which comprises

a. separate hot and cold water valve means,

b. a single control handle faucet means for opening and closing said hot and cold water valve means,

c. cam means controlled by said control handle faucet means, said control handle faucet means being rotatable through substantially more than 180 degrees,

d. cam follower means carried by said hot and cold water valve means engageable with said cam means,

e. an abutment means rotatable with said control handle faucet means,

f. and a comfort stop engageable by said abutment means to provide a comfortable tub and shower temperature for the user of said tub and shower,

g. said abutment means comprises a control member carried by said control handle faucet means,

h. said control member being movable so as to clear said comfort stop permitting a further rotation of said control handle faucet means,

i. said anti-scald apparatus further having a safety stop engageable with said abutment means after said abutment means passes said comfort stop,

j. and including means to adjust the position of said comfort stop thereby varying the temperature of the water of said tub and shower when said abutment means engages said comfort stop.

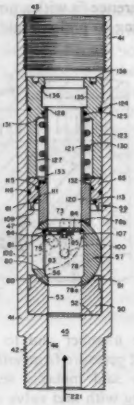
4,220,176

METHODS AND APPARATUS FOR CONTROLLING FLUID FLOW

Larry R. Russell, 6420 Hillcroft, Houston, Tex. 77081

Filed Apr. 10, 1978, Ser. No. 895,157
Int. Cl.[3] E21B *41/00*
U.S. Cl. 137—496 37 Claims

1. Valve apparatus, comprising main valve means having a straight open fluid flow passage therethrough, said main valve means being biased toward an open position and being movable to a closed position in response to fluid flow imposing fluid pressure thereagainst in one direction when said fluid flow passage is closed, and pilot valve means for closing said fluid flow passage in response to fluid flow imposing fluid pressure in said one direction to enable said main valve means to close when fluid pressure thereagainst is in said one direction, said pilot valve means when open having a fully open



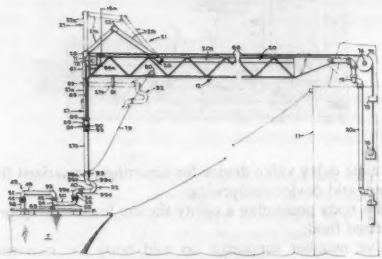
flow passage therethrough in line with and at least as large as said fluid flow passage of said main valve means.

4,220,177

OFFSHORE LOADING SYSTEM WITH ARTICULATED MANIFOLDS

William A. Gill, El Toro, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 9, 1978, Ser. No. 867,635
Claims priority, application United Kingdom, Feb. 8, 1977, 5068/77
Int. Cl.[2] B67D *5/00*; F16L *3/00*
U.S. Cl. 137—615 10 Claims



1. An offshore loading system for transferring fluid from a first fluid handling means to a second fluid handling means and to provide for relative movement between the two handling means, said system comprising:

a support structure for mounting on said first fluid handling means;

a support boom having an inboard end connected to said support structure;

a boom conduit member having an articulated portion at one end thereof, said boom conduit member being mounted along said boom with said articulated portion at the outboard end of said support boom;

a vertical conduit member;

means for connecting said vertical conduit member to the outboard portion of said support boom;

means for pivotally connecting the upper end of said vertical conduit member to the articulated end portion of said boom conduit member;

an articulated manifold assembly for interconnecting a lower

end of said vertical conduit member with said second fluid handling means;

said vertical conduit member includes an upper portion and a lower portion and means for pivotally connecting the lower end of said upper portion to the upper end of said lower portion, means for locking said upper portion and said lower portion together in rigid alignment for maintaining said vertical conduit member in a fixed position,

said manifold assembly having pivotal means for facilitating both relative horizontal and vertical movement between the lower end of said vertical conduit member and said second fluid handling means while said vertical conduit member is maintained in a fixed position by said locking means.

4,220,178

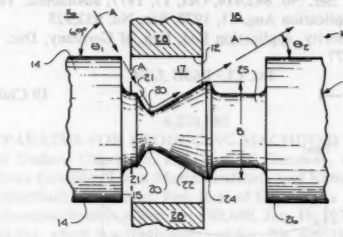
MOMENTUM BALANCE SPOOL

Alan D. Jackson, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Jan. 31, 1979, Ser. No. 7,873

Int. Cl.³ F16K *3/22*

U.S. Cl. 137—625.3 **10 Claims**



1. In a control valve having a valve spool with alternately spaced grooves and lands, and a conventional body having a bore in which the spool is slidable from a closed position to at least one metering position providing restricted flow from a pressurized cavity in the body across a spool groove to an exhaust cavity in the body, the improvement comprising:

a metering land cut approximately 90 degrees on the valve spool;

the metering groove on the valve spool having a circumferential turning surface longitudinally positioned to intercept the high velocity stream entering the groove across the metering land;

a circumferential diverging exit ramp tangentially positioned adjacent the turning surface; the exit ramp terminating with a maximum diameter forming an annular opening with the bore.

4,220,179

SPACER FOR COAXIAL TUBE SYSTEMS

Ernst Scheffler; Friedrich Schatz, and Gerhard Ziemek, all of Langenhagen, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

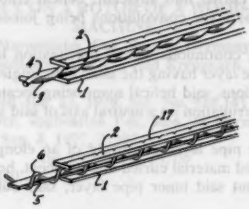
Division of Ser. No. 847,083, Oct. 31, 1977, Pat. No. 4,161,960. This application Feb. 21, 1979, Ser. No. 13,043

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1975, 2547423

Int. Cl.³ F16L *9/18*

U.S. Cl. 138—113 **3 Claims**

1. A coaxial tube system, including a helical spacer for spacing an inner tube of the system from another tube thereof in coaxial relation, there being a temperature gradient between the tubes, the helical spacer comprising an assembly of a plurality of flat, elongated, superposed, relatively narrow elements, including a first and a second ribbon; a third, elongated element disposed between the first and the second ribbon; and a filament element helically looped around the third element, but not around the first and second ribbon, so that the third element and the filament are held between the first and second ribbons, the assembly as a whole being helically placed on said inner tube.



4,220,180

FLEXIBLE PIPE JOINT

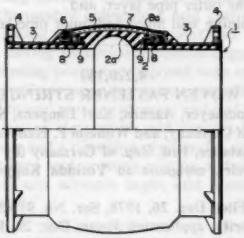
Tomohiro Koga; Tetsuji Saigusa, and Mamoru Kadono, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 28, 1978, Ser. No. 974,272

Claims priority, application Japan, Apr. 18, 1978, 53-51650[U]

Int. Cl.³ F16L *11/00*

U.S. Cl. 138—120 **11 Claims**



1. A flexible pipe joint comprising a pair of spaced apart and opposed hard tubular bodies having a smooth cylindrical outer surface near the inner end thereof, a cylindrical rubber body including a reinforcing layer embedded therein and connecting said pair of hard tubular bodies with each other, a circumferential rib projecting outwardly in a radial direction from that portion of each of said hard tubular body which is separated outwardly in the axial direction from the inner end of said hard tubular body, and circumferential reinforcing means embedded in that position of said cylindrical rubber body which is surrounded by the inside surface of said circumferential rib, the outer smooth cylindrical surface of said hard tubular body, a vertical plane passing the inner end of said hard tubular body and said reinforcing layer.

4,220,181

MULTI-LAYER PIPE WITH SINGLE CORRUGATION IN INNER WALL

James Nyssen, 10045 Kenswood Dr., Chilliwack, British Columbia, Canada

Continuation-in-part of Ser. No. 867,140, Jan. 5, 1978, abandoned. This application Mar. 29, 1979, Ser. No. 25,201

Int. Cl.² F16L *9/06, 9/18*

U.S. Cl. 138—154 **7 Claims**

1. A mutil-layer, spirally wound pipe with a substantially

smooth interior wall having a single, helical corrugation in the inner wall and a corrugated exterior wall, comprising

a. an inner pipe layer consisting of an elongated sheet of material curled into adjacent, helical convolutions, said inner pipe layer convolutions being joined by a helical seam,

b. a single, continuous helical corrugation located in said inner pipe layer having the same helix angle as said helical convolutions, said helical seam being located within said single corrugation on a neutral axis of said single corrugation,

c. an outer pipe layer consisting of an elongated sheet of corrugated material curled into adjacent, helical convolutions about said inner pipe layer, said outer pipe layer

convolutions being joined by a helical seam, said seam being located on a neutral axis of a corrugation of said outer pipe layer,

d. the helix angle of the helical convolutions of said outer pipe layer being substantially the same as the helix angle of said single corrugation,

e. said neutral axis of said single corrugation having said helical seam being coextensive with at least a portion of a neutral axis of one of the corrugations of said outer pipe layer and said single corrugation lying within one of the corrugations of the outer pipe layer thereby locating the helical seam of inner pipe layer within said one corrugation of the outer pipe layer, and

f. means joining said inner and outer pipe layers.

4,220,182

WOVEN FASTENER STRINGER

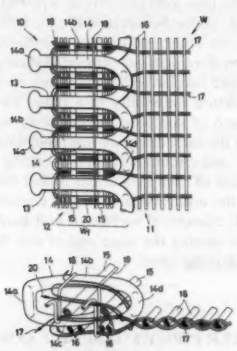
Friedrich Glindmeyer, Aachen; Karl Limpens, Stolberg, both of Fed. Rep. of Germany, and Wilhelm F. Hennenberg, deceased, late of Constance, Fed. Rep. of Germany (by Anneliese Hennenberg, heir), assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,539

Claims priority, application Japan, Dec. 29, 1977, 53-88

Int. Cl.[3] A44B *19/42*; D03D *1/00*

U.S. Cl. 139—384 B **4 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction, and a heel portion at the opposite end remote from said head connected to a next adjacent one of said successive loops; and a combination of binding threads comprising a plurality of binding warp threads extending in parallel relation over said upper legs and alternately overlying and underlying said foundation weft and a binding weft thread interlaced with said binding warp threads substantially in a common plane defined by the upper surfaces of said upper legs and looping around said foundation weft at a position interiorly of said heel portion, said binding weft thread passing around one of said plurality of binding warp threads adjacent to said coupling head and over said upper leg and alternately overlying and underlying said plurality of binding warp threads in the spaces between each adjacent pair of said loops.

4,220,183

STEEL CYLINDER FOR THE STORAGE OF GAS MIXTURES

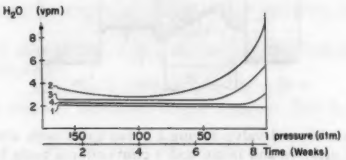
Cetin Gökcek, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH. Patentabteilung, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 842,414, Oct. 17, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,925

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2364377

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—1 **10 Claims**



1. In a method of preserving in a storage vessel a volumetric ratio of a calibrating gas mixture within a range from below 1 vpm to about 10,000 vpm, said calibrating gas mixture including a carrier gas and a predetermined trace of another gas, said storage vessel having inner steel walls electroplated with a metal selected from the group of tin, zinc, nickel and lead, the selection depending on the mixture, the steps comprising:

introducing said gases into said storage vessel under relatively high pressure of not more than 200 atmospheres;

storing said gases in said storage vessel, so as to preserve the volumetric ratio between said gases within a predetermined accuracy,

transporting said gas mixture within said storage vessel, and

discharging said calibrating gas mixture from said storage vessel while still retaining said volumetric ratio.

4,220,184

DELIMBER

Howard F. Hallett, and Clarence W. Hallett, both of, P.O. Box 1302 Prince George, British Columbia, Canada (V2L 4V3)

Filed Dec. 14, 1978, Ser. No. 969,300

Int. Cl.[3] B27L *1/06*

U.S. Cl. 144—2.Z **14 Claims**

1. A delimber attachment for a tractor, the attachment having a forward end and comprising:

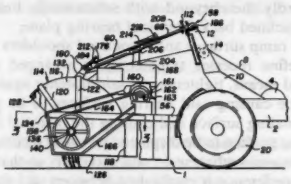
an elongate drum mounted transversely and rotatably within a downwardly opening enclosure, the drum having a plurality of chains connected at one end thereto;

a frame extending from the enclosure towards the forward end;

a hinge connector on the frame near the forward end for

hingedly connecting the delimber to the tractor and permitting upward and downward pivoting of the delimber;

cable securing means connected to a top portion of the enclosure; and



a hydraulic damping cylinder having a first end connected to the delimber, extending upwardly and towards the forward end of the delimber, and having means near a second end of the cylinder for connecting the cylinder to the tractor above the hinge connector.

4,220,185

APPARATUS FOR PRODUCING MACHINED TIMBER

Josef Traben, Oberkirch, Fed. Rep. of Germany, assignor to Firma Gebrüder Linck Maschinenfabrik und Eisen/Giesserei Gatterlinck, Oberkirch, Fed. Rep. of Germany

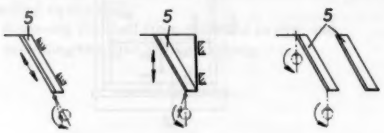
Continuation-in-part of Ser. No. 760,660, Jan. 19, 1977, Pat. No. 4,143,692, which is a continuation of Ser. No. 607,298, Aug. 25, 1975, Pat. No. 4,086,944. This application Jun. 29, 1978, Ser. No. 920,266

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751238

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.

Int. Cl.³ B27L *9/00*

U.S. Cl. 144—3 P **4 Claims**



1. Apparatus for producing timber from elongated, round or substantially round timber logs, comprising:

a feeding device for receiving a log and advancing the log axially;

two spaced, opposed banks of staggered cutters that are respectively disposed progressively closer to the longitudinal axis of said log in the direction of advance of said log;

means for oscillating said banks of cutters for separating wood sections from said log as the latter is advanced;

at least one presser element disposed ahead of a corresponding associated one of said cutters in the direction of advance of said log for engaging said log and preventing the wedge gap produced by the associated cutter from extending beyond the cutter to an extent to produce a split in the log; and

at least one guide located ahead of a corresponding associated one of said elements in the direction of advance of said log for slidably engaging said log ahead of the formation of said wood sections and exerting pressure against the log to minimize the formation of cracks or splits.

4,220,186

ARRANGEMENT FOR MOUNTING A CUTTING BLADE, PARTICULARLY ON A ROTOR OF A WOOD-CHIPPING MACHINE

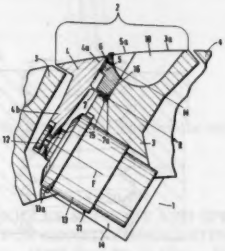
Hans Sybertz, Hargesheim, Fed. Rep. of Germany, assignor to Hombak Maschinenfabrik KG, Bad Kreuznach, Fed. Rep. of Germany

Filed Jun. 22, 1978, Ser. No. 918,141

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730107; Sep. 3, 1977, 2739749

Int. Cl.² B27G *13/00*

U.S. Cl. 144—230 **35 Claims**



1. In a material-removing tool, particularly in a wood chipping machine, a combination comprising a support having at least one supporting portion; at least one cutting blade; and means for interchangeably connecting said cutting blade to said support, including at least one actuator and at least one pressing element having an actuating portion engaged by said actuator and a pressing portion juxtaposed with said supporting portion, and resilient mounting means extending between and being affixed to said pressing element and said support and mounting said pressing element on said support for pivoting between a releasing and a clamping position for clamping said cutting blade between said pressing portion and said supporting portion when said actuator urges said pressing portion toward said support.

4,220,187

SELF-LOCKING FASTENER

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48018

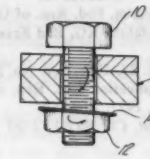
Continuation-in-part of Ser. No. 788,296, Apr. 18, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 912,128

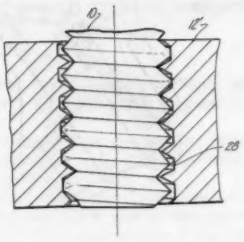
Int. Cl.² F16B *39/28*

U.S. Cl. 151—20 **2 Claims**

1. In combination: a male fastener element having a standard external thread form characterized by a relatively sharp helical crown and a female fastener element of fixed configuration having an internal thread form adapted to mate with said external thread form, the internal thread form of the female fastener element being truncated at the root thereof to form a helical flat which is substantially parallel to the thread axis and uniformly disposed therearound, the thread depth of said female element being such as to create a small predetermined radial clearance between said flat and the sharp crown of the standard male thread when conjugal therewith to produce free-running operation thereof under non-loaded conditions, the thread form of said female fastener element providing overall radial clearance from the threads of such male element sufficient to allow relative lateral displacement of said elements to engage the crown of the male thread with the said helical flat; one of the fastener elements having an external bearing surface which is non-orthogonal to the thread axis thereof such that when the female fastener element is tightened on the male fastener with the said bearing surface against a workpiece, the female fastener element is laterally loaded against the male fastener element causing the crown of male fastener thread

form to jam laterally against the helical flat over at least part of the area of mutual threaded engagement thereby to resist





loosening of the female and male fastener elements under conditions of vibration.

4,220,188

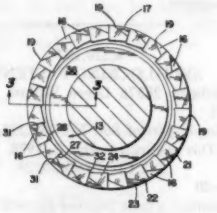
LOCKING FASTENER

John C. McMurray, Painesville, Ohio, assignor to Russell, Burdsall & Ward Corporation, Mentor, Ohio

Filed Jul. 10, 1978, Ser. No. 923,330

Int. Cl.[2] F16B *39/282*

U.S. Cl. 151—37 **16 Claims**



1. A threaded fastener comprising thread means, a load surface, and wrenching means permitting said fastener to be tightened and loosened, said load surface being adapted to be tightened against a substantially flat mating surface and providing self-locking means including:

(a) a plurality of bearing surfaces symmetrically positioned around said thread means and substantially contained in a substantially flat and radial bearing plane, each bearing surface providing a narrow end in the direction of tightening rotation, a wider end in the direction of loosening rotation, a peripheral length and an inner side edge respectively joining the radially outer and inner extremities of said ends, said wider end of each bearing surface having a radial length which is substantially less than said peripheral length;

(b) an inclined ramp surface extending inwardly from each of said inner side edges beyond the radially inner extremity of said wider end and back from said bearing plane;

(c) radially and axially extending shoulders joining said wider end of said bearing surfaces and the adjacent end of said ramp surfaces, said shoulders extending radially inwardly a substantial distance beyond the radially inner extremity of said wider end, the height of said shoulders increasing in a radially inward direction to the radially inner extremity of said wider end and extending radially inwardly therebeyond with substantially uniform height and inclined back from said bearing plane;

(d) said ramp surfaces and associated shoulders cooperating to define recesses symmetrically arranged around said thread means, tightening of said fastener against a mating surface causing said bearing surfaces to be pressed into said mating surface and causing the material forming said mating surface to be displaced past said bearing plane into said recesses adjacent to said shoulders so that a mechanical interference is established between said shoulders and the material of said mating surface displaced past said bearing plane to resist loosening of said fasteners, said ramp surfaces engaging the material displaced past said bearing plane while said fastener is being tightened and operating to provide a camming action allowing continued tightening of said fastener without encountering excessive torque, and the total area of said bearing surfaces being sufficiently small to allow them to penetrate into said mating surface without excessive torque, increased penetration of said bearing surfaces into said mating surface causing a progressively increasing length of said shoulders to penetrate into said mating surface without increasing the size of said bearing surface.

4,220,189

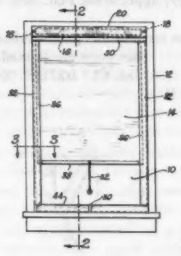
WINDOW SHADE SEALING SYSTEM

Fidencio G. Marquez, 619 Ocean Blvd., Coronado, Calif. 92118

Filed Dec. 18, 1978, Ser. No. 970,472

Int. Cl.[2] E04F *10/06;* **E04B** *9/08*

U.S. Cl. 160—23 R **2 Claims**



1. A window shade sealing system for sealing the entire periphery of a window shade covering a window having a continuous peripheral window frame to prevent the passage of air around said shade, said sealing system comprising:

(a) a shade roller housing mounting a roller shade and defining a pay-out slit through which the leading edge of a roller shade feeds, said slit defined at one side by an elongated mounting strip having means adhering same against said frame above said window and defined at the other side by a pressure-applying member compressing said shade against said mounting strip;

(b) a pair of resilient vertical guide channels and a horizontal bottom channel, each of said channels being generally U-shaped to straddle an edge of said shade and comprising a flat sealing strip having means adhering same to said window frame adjacent said window and a resilient pressure-applying lip compressed against said sealing strip with its outer edge in its normal state to press said shade at its vertical and bottom peripheral areas against said sealing strip, with the upper ends of said vertical guide channels aligned with said pay-out slit and the lower ends thereof

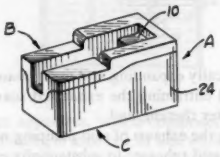
aligned with said horizontal bottom channel, such that said shade is maintained in positively gripped sealed relation against said sealing strip continuously along its entire periphery whereby a complete instantly installed window shade and peripheral sealing apparatus is provided, any one unit of which is adaptable to fit window frames of different heights and irregular vertical side frame members.

4,220,190

METHOD OF MAKING TOOLING

Robert A. Horton, Chesterland; John H. Simmons, Lyndhurst, and Timothy R. Bauer, Euclid, all of Ohio, assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Filed Nov. 2, 1978, Ser. No. 957,103
Int. Cl.[3] B22C *7/02, 9/04*
U.S. Cl. 164—35 **3 Claims**



1. A method of making cast metal tooling having a cavity comprising the steps of:

(a) making a positive model which is the counterpart of the cavity;

(b) making a uniform thickness disposable pattern by coating the model with a thin layer of investment casting pattern material;

(c) removing the pattern from the positive model;

(d) coating or investing the pattern with refractory material to form a one-piece investment mold;

(e) removing the pattern from the investment mold to form a mold cavity;

(f) filling the mold cavity with a selected alloy to form a thin walled cavity shell;

(g) removing the shell from the mold cavity; and,

(h) providing the shell with a backing.

4,220,191

METHOD OF CONTINUOUSLY CASTING STEEL

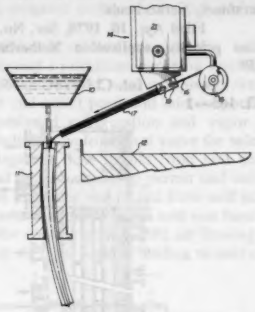
John E. Fogarty, Burlington, Canada, assignor to Slater Steel Industries Limited, Ontario, Canada

Continuation of Ser. No. 736,495, Oct. 28, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,564
Claims priority, application United Kingdom, May 17, 1976, 20260/76
Int. Cl.[3] B22D *27/20*
U.S. Cl. 164—57 **2 Claims**

1. A method of continuously casting steel in a caster which does not employ a ceramic shroud which includes the step of:

continuously introducing molten steel into an open-bottomed mould; and

continuously introducing aluminum in the form of a wire coated with a metal oxide fluxing agent into said molten steel as the latter enters the mould, said metal oxide fluxing agent consisting essentially of manganese oxide in an amount of 6% to 15% by weight based on the weight of the aluminum wire introduced, excluding the weight of bonding agent for said metal oxide fluxing agent; whereby alumina upon formation in the steel floats to the surface of the molten steel, is fluidized and is carried away from the



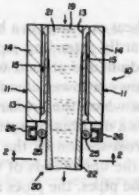
surface of the molten steel between the mould and the cast steel.

4,220,192

COMBINED ROLLER SUPPORT AND SPRAY COOLING SYSTEM FOR CONTINUOUS CASTING MOLDS

Kirk M. Gladwin, 21000 East River, Grosse Ile, Mich. 48138

Filed May 29, 1979, Ser. No. 43,020
Int. Cl.[2] B22D *11/124, 11/128*
U.S. Cl. 164—89 **7 Claims**



6. A method for maintaining the alignment of a slab support roller and the cooling spray nozzles located at the bottom of a molten metal continuous casting mold formed of opposed side walls and end walls and with an open upper end into which molten metal is poured for casting within the mold, and an open lower end through which the solidifying cast slab is downwardly withdrawn from the mold, and with a roller located at the bottom of one of the mold walls for engaging a face of the slab just beneath the mold, the roller being rotatably mounted upon an elongated support bar which is secured beneath the mold wall, and with water cooling spray nozzles located adjacent the roller arranged for spraying water upon the slab in the vicinity of the roller and adjacent the bottom of the mold, comprising:

forming a hollow passageway, generally lengthwise through the support bar and forming a number of generally transverse passageways extending from the lengthwise passageway to the bar surface closest to the roller and cast slab and terminating in open ends forming spray nozzles;

continuously flowing water into and through the lengthwise passageway and out through the transverse passageways with the water flow through said passageways continuously cooling the support bar internally, to prevent warping and twisting of the bar due to heat, and with the water spraying upon the slab and the roller for simultaneously cooling both, wherein the dimensional stability of the bar due to the continuous water flow cooling maintains the alignment of the roller mounting and the roller and also maintains the pre-set alignment of the cooling spray nozzles.

4,220,193

METHOD AND EQUIPMENT FOR HEAT EXCHANGE

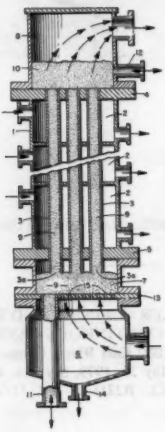
Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil, B.V., Amersfoort, Netherlands

Filed Apr. 10, 1978, Ser. No. 895,056

Claims priority, application Netherlands, Apr. 12, 1977, 7703939

Int. Cl.[2] F28C *3/16*

U.S. Cl. 165—1 8 Claims



1. A method of heat exchange in a heat exchanger which has a plurality of upwardly extending pipes for upward flow of a primary liquid medium and around which in operation a secondary medium flows, a lower chamber at the lower ends of the said pipes from which the primary liquid enters the pipes and which contains a distribution system adapted to distribute flow across the cross-section of the lower chamber, and an upper chamber at the upper ends of the pipes into which the fluid passes from the pipes, the pipes and the upper and lower chambers containing fluidisable particulate material, in which method the flow-rate of the primary liquid medium is selected so that the particulate material is fluidised within the pipes and within the upper and lower chambers without mechanical stirring, the particulate material being free to expand in said upper chamber, the distribution system causes the primary liquid medium to be admitted to the pipes substantially uniformly across the transverse cross-section of the lower chamber and the pressure drop (ΔP_d) across the distribution system and the pressure drop (ΔP_b) caused by all of the particulate material satisfy the condition:

$$0.01 < \Delta P_d \cdot 100/\Delta P_b < 400.$$

4,220,194

SCAVENGING OF THROTTLED MSR TUBE BUNDLES

Russell L. Shade, Jr., Cape Elizabeth; William G. Reed, Portland, and Jack S. Mazer, South Portland, all of Me., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 890,674, Mar. 27, 1978. This application Jul. 24, 1978, Ser. No. 927,028

Int. Cl.[2] F28B *9/02*

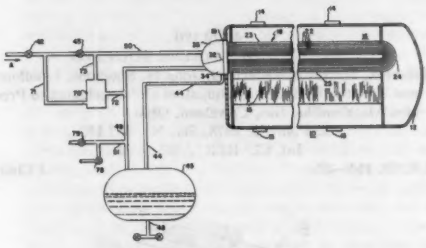
U.S. Cl. 165—1 11 Claims

1. The method of substantially eliminating condensate subcooling within the tubes of a reheater of a tube and shell reheater wherein shellside steam is reheated by passing in heat-exchange relationship with tubes of a reheater containing saturated tubeside steam, said reheater having an input of saturated steam which is at higher pressure than that of the saturated steam which is input to the shellside, which method comprises:

(a) throttling main line steam to provide a reduced pressure of steam input to said reheater;

(b) supplying exhausted scavenging steam from said reheater to a low-pressure input of a high differential pressure pumping means;

(c) supplying unthrottled main line steam to said high differential pressure pumping means;



(d) isentropically expanding said main steam in said pumping means and entraining the exhausted scavenging steam of said reheater therein; and

(e) supplying the exhaust of said pumping means to the input header of said reheater to substantially eliminate condensate subcooling in the tubes of said tube bundle at throttled, partial loading conditions.

4,220,195

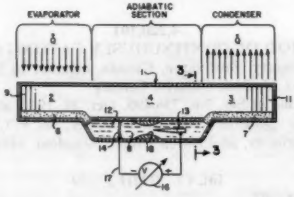
ION DRAG PUMPED HEAT PIPE

Milton J. Borgoyn, Glen Burnie, and Archer S. Mitchell, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1979, Ser. No. 42,165

Int. Cl.[3] F28D *15/00*

U.S. Cl. 165—1 13 Claims



1. A method of increasing the capillary pumping capability of a capillary structure contained in a heat pipe for the purpose of transporting a working fluid in a liquid condensate form from a condenser section to an evaporator section in which said liquid is vaporized and cycled as a gas back through said pipe to said condenser section, comprising:

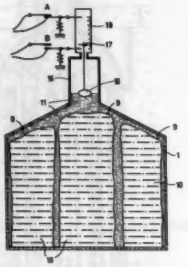
creating an ion flow axially within and in the same flow direction as said working fluid for increasing the momentum of said fluid, and

applying said increased momentum to said liquid condensate for increasing said pumping capability.

4,220,196
HEAT STORAGE DEVICE

Klaus Gawron, Aachen, Fed. Rep. of Germany; Faramarz Mahdjuri, Bergamo, Italy, and Johann Schröder, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,069
Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720188; Oct. 3, 1977, 2744468
Int. Cl.² F28D *21/00*
U.S. Cl. 165—11 R **5 Claims**



1. Heat-storage apparatus, which comprises a closed reservoir having rigid walls, at least one of said walls being effective for transmission of heat; a flexible closed container positioned within said reservoir and having a maximum volume less than that of the reservoir, said flexible container enclosing a material that accumulates heat by transition from the solid phase to the liquid phase and that is capable of exchanging heat through said heat-transmitting reservoir wall, and said flexible container, when the heat-accumulating material therein is in its liquid phase, being in direct contact with the reservoir walls; and a heat-transport medium in said reservoir outside of said flexible container, said heat-transport medium being a heat-conductive substance that remains completely or substantially completely in the liquid phase throughout the effective temperature range of the apparatus and that is present in an amount to completely fill any spaces formed between the reservoir walls and the flexible container upon thermal shrinkage of the heat-accumulating material due to solidification thereof.

4,220,197
HIGH SPEED VARIABLE DELIVERY HELICAL SCREW COMPRESSOR/EXPANDER AUTOMOTIVE AIR CONDITIONING AND WASTE HEAT ENERGY RECOVERY SYSTEM

Donald D. Schaefer, Farmington; David N. Shaw, Unionville, and Joseph A. M. Gagnon, Windsor Locks, all of Conn., assignors to Dunham-Bush, Inc., West Hartford, Conn.

Filed Jan. 2, 1979, Ser. No. 601
Int. Cl.² B60H *3/00*
U.S. Cl. 165—35 **23 Claims**

1. An improved air conditioning and waste heat energy recovery system for an automotive vehicle, said vehicle including an occupant cab to be air conditioned, an engine driven drive shaft, an engine exhaust gas passage, and a cab conditioned air flow passage leading to said cab, the improvement comprising:

a helical screw compressor/expander unit, said unit including intermeshed helical screw rotors, one of said rotors being connected to the drive shaft to be driven thereby during compressor operation and for driving said drive shaft during expander operation,

inlet and outlet ports for said compressor/expander unit,

a capacity control slide valve for said compressor/expander unit operatively controlling inlet flow to said intermeshed helical screw rotors through said inlet port,

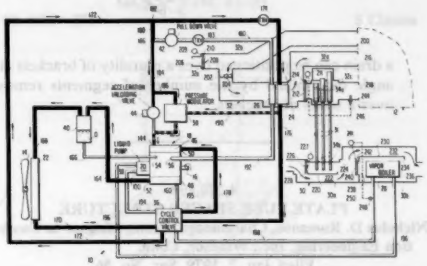
a volume ratio control slide valve for said compressor/expander unit operatively controlling working fluid discharge flow from said unit at said outlet port,

a condenser coil,

an evaporator coil mounted within said conditioned air flow passage,

a vapor boiler within said exhaust gas passage,

conduit means carrying a refrigerant working fluid for fluid connecting said vapor boiler, said compressor/expander unit at said inlet and outlet ports and said evaporator in a closed loop combined refrigeration and vapor power circuit and including a cycle control valve for selectively controlling refrigerant flow to and from said unit, said vapor boiler and said condenser to permit said unit to act selectively as an expander and to and from said unit, said condenser and said evaporator when said unit functions as a compressor, for cooling conditioned air flowing within said conditioned air flow passage leading to said cab,



passive heat exchange means between said conditioned air flow and said exhaust gas passages,

first bypass means within said exhaust gas passage for selectively bypassing exhaust gas about said vapor boiler and said passive heat exchange means, such that selectively said exhaust gas may vaporize working fluid within said vapor boiler and for driving said helical screw compressor/expanded unit as an expander to positively rotate said drive shaft to thereby recover thermal energy from the exhaust gas, and

second bypass means within said conditioned air flow passage leading to said cab for selectively causing the air entering said cab when said cab requires air conditioning to bypass said passive heat exchange means or for causing waste heat of the exhaust gas to heat the air entering the cab absent operation of said evaporator coil when said cab requires heat.

4,220,198
BRACKET APPARATUS

James M. Jennings, 3211 Wickersham Ct., Orlando, Fla. 32806, and Nicholas S. Pazar, 244 Sylvan Dr., Winter Park, Fla. 32789

Filed May 3, 1978, Ser. No. 902,728
Int. Cl.² F28F *9/06*
U.S. Cl. 165—67 **11 Claims**

1. A unitary bracket for hanging finned tubes, drain troughs, and the like, comprising in combination:

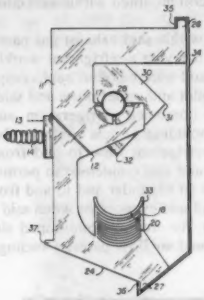
a base support portion;

wall attachment means for attaching said bracket to a wall, said wall attachment means being attached to said base support portion;

tube support means for supporting a portion of a tube in a predetermined position, said tube support being attached to said base support portion; and

drain support means for supporting an elongated drain trough for collecting moisture from said tube mounted in said tube support, said drain support means being attached to said base support portion, and having a plurality of connected segments removably attached thereto for ad-

justing the angle of said drain trough mounted on said drain support means by the removal of segments, whereby



a drain can be positioned over a plurality of brackets at an angle determined by the number of segments removed over a series of brackets.

4,220,199

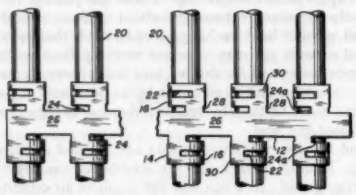
PLATE TUBE SPACER STRUCTURE

Nicholas D. Romanos, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jan. 2, 1979, Ser. No. 56

Int. Cl.[2] F28F *19/00, 9/00*

U.S. Cl. 165—134 R **10 Claims**



1. An elongated plate operable for concomitantly effecting the spacing and the support of one layer of individual tubes of a tube bundle of a heat exchanger comprising a relatively thin, metallic member of relatively narrow width having a multiplicity of tube engaging means formed along each longitudinally extending side edge thereof; said multiplicity of tube engaging means being disposed so as to provide the elongated plate with two parallel rows thereof; said multiplicity of tube engaging means of one of said two parallel rows thereof being disposed so as to all face in the same direction; said multiplicity of tube engaging means of the other of said two parallel rows thereof being disposed so as to all face in the same direction, but in a direction opposite to that in which said multiplicity of tube engaging means of said one of said two parallel rows thereof face; said multiplicity of tube engaging means of both of said two parallel rows thereof all being disposed so as to project outwardly in a common direction away from the plane defined by the longitudinal axis of the elongated plate; said multiplicity of tube engaging means each having a configuration that is complementary to the configuration of the individual tubes to be received in spaced and supported relation thereto; and said multiplicity of tube engaging means each having formed therein means operative to discourage deposit buildup thereon and on the individual tubes received in tangential engagement therewith.

4,220,200

HEAT EXCHANGER SYSTEM

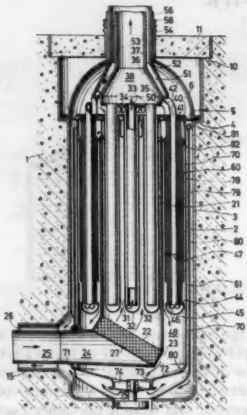
Max Weber, Wiesendangen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,981

Claims priority, application Switzerland, Nov. 12, 1976, 14247/76

Int. Cl.[2] F28D *7/12*

U.S. Cl. 165—142 **14 Claims**



1. A heat exchange system for a gas-cooled high-temperature reactor comprising

a cylindrical jacket for guiding a flow of hot primary gas longitudinally therethrough;

a plurality of blind tubes disposed axially within said jacket for passage of the hot primary gas thereover;

a plurality of counter-current heat exchangers disposed about said jacket in parallel relation to said blind tubes and in communication with the flow of primary gas for passage of the primary gas thereover, each said heat exchanger having means therein for passage of a flow of working gas in counter-current to the primary gas; and

a plurality of insert tubes in communication with said means of said heat exchangers, each said insert tube being disposed coaxially in a respective blind tube to define an annular gap for passage of a working gas therethrough from said heat exchanger means to the interior of said respective insert tube.

4,220,201

CASING PERFORATOR

Ernest D. Hauk, Yucca Valley, Calif., assignor to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed Feb. 21, 1979, Ser. No. 13,270

Int. Cl.[2] E21B *43/112*

U.S. Cl. 166—55.2 **24 Claims**

16. A casing perforator adapted to be inserted into a casing to make a series of perforations therein, said perforator comprising

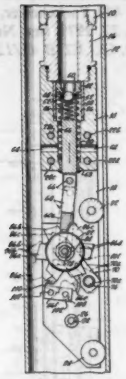
an elongated perforator body,

a pivot arm journalled on said body about a pivot axis,

a cutter wheel journalled on said pivot arm for rotation about a wheel axis, said wheel having a plurality of cutting teeth,

means for moving said pivot arm and wheel to a cutting position wherein two of said teeth contact the interior of a casing to be perforated, and wherein said wheel axis is close to but slightly spaced in one direction from a dead-

center line between said pivot axis and a point of contact of one of said two teeth with the casing, and



means for driving said body in a second direction opposite said one direction.

4,220,202

APPARATUS FOR REALIZATION OF ROCK EXPLOITATION METHOD BASED ON THERMODYNAMIC CYCLES UTILIZING IN SITU ENERGY SOURCE

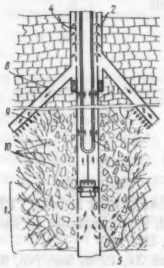
Ivan T. Aladiev, ulitsa Georgiu-Dezh, 3, kv. II.; Kirill D. Voskresensky, Komsomolsky prospekt, I4/I, kv. 79, both of Moscow; Gennady P. Gukov, poselok Vidnoe, ulitsa Lesnaya, 6, kv. 13, Moskovskaya oblast; Evgeny V. Saperov, poselok Moskvorochie, 52, kv. 4, and Valery K. Fardzinov, Strastnoi bulvar, I3-a , kv. 42, both of Moscow, all of U.S.S.R.

Continuation of Ser. No. 571,305, Apr. 24, 1975, abandoned, which is a division of Ser. No. 414,772, Nov. 12, 1973, Pat. No. 3,938,592, which is a continuation of Ser. No. 122,483, Mar. 9, 1971, abandoned. This application Apr. 15, 1976, Ser. No. 677,167

Claims priority, application U.S.S.R., Mar. 23, 1970, 1416581[I]

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—57 **8 Claims**



1. An apparatus for a rock-exploitation method based on thermodynamic cycles utilizing an in-situ energy source, comprising: a well with a casing sunk at least as far down as a producing horizon; a string of exploitation pipes in said well open at the bottom end thereof forming a fluid inlet and having at least one opening in a side wall and above the bottom forming a fluid outlet; said opening in said sidewall being located above the producing horizon and serving to discharge fluid from said well into a fluid-permeable rock mass adjacent said well, said open bottom end of said exploitation pipes being located in the producing horizon and admitting stratal fluid to said well; said fluid being utilized as a heat-carrying medium in an underground circuit which includes said fluid inlet, a section of said well between said fluid inlet and said fluid outlet, and said fluid-permeable rock mass; means located in said well for varying the heat content of the heat-carrying medium in heat-exchange relationship with said fluid; and means for admission and circulation of a heat-carrying agent into said means for varying the heat content and said well.

4,220,203

METHOD FOR RECOVERING COAL IN SITU

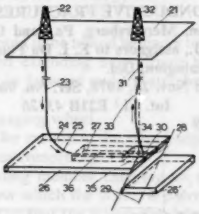
Johannes W. M. Steeman, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 6, 1978, Ser. No. 967,089

Claims priority, application Netherlands, Dec. 6, 1977, 7713455

Int. Cl.[2] E21C *43/00*

U.S. Cl. 166—271 **5 Claims**



1. A method for recovering coal in situ by drilling two bore holes from the surface into the coal seam, at least one of which holes is at least partially located in the plane of the coal seam, linking the two bore holes near their ends, supplying a medium that will react with the coal by way of one of the bore holes and withdrawing the reaction product along the other bore hole, the improvement comprising drilling the bore hole that is at least partially located in the plane of the coal seam prior to drilling the other bore hole, enlarging the first drilled bore hole at least at its end over such a length and to such a width as corresponds with at least twice the maximum deviation to be expected in the horizontal projection of the second drilled bore hole, drilling the second bore hole at least so far as to connect with the enlarged end of the first bore hole.

4,220,204

OIL RECOVERY METHOD UTILIZING A DIALKYL PHENOL POLYETHOXY ALKYL SULFONATE AS A SOLUBILIZING CO-SURFACTANT

James W. Hughes, Missouri City; Mohan V. Kudchadker, and Nancy G. Dunn, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

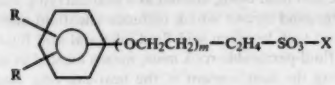
Filed Apr. 18, 1979, Ser. No. 31,261

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—274 **8 Claims**

1. A process for recovering petroleum from an underground petroleum reservoir penetrated by at least one injection means and at least one production means, said means being in fluid communication with each other, and containing a brine ranging in salinity from about 10,000 to about 200,000 ppm total dissolved solids including up to about 20,000 ppm divalent ions comprising:

a. injecting into the reservoir through said injection means a surfactant-containing fluid which comprises an effective amount of a water soluble petroleum sulfonate and a solubilizing cosurfactant which comprises a dialkylbenzene polyethoxy alkyl sulfonate of the formula:



where R is an alkyl group containing from 6 to 14 carbon atoms, m is a number from 2 to 12 and X is a cation,

b. forcing the surfactant-containing fluid through the reservoir and

c. recovering petroleum from said production means.

4,220,205

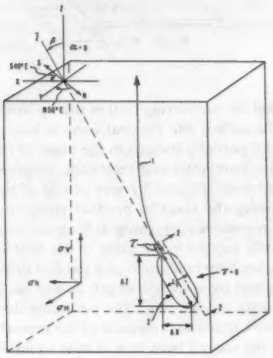
METHOD OF PRODUCING SELF-PROPPING FLUID-CONDUCTIVE FRACTURES IN ROCK

David L. Coursen, Mercersburg, Pa., and George R. Cowan, Woodbury, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 28, 1978, Ser. No. 964,426

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—299 **10 Claims**



1. A method of producing fluid-conductive fractures confined within an underground formation under tectonic stress comprising

(a) drilling a hole into the formation so that a long portion of the hole, said portion being at least 50 diameters in length, in a zone to be fractured has an average axial orientation that is slanted with respect to the directions of the principal stresses existing in the formation, the orientation being selected to place the hypothetical fracture plane, defined as that plane containing the hole axis which has the least normal compressive stress acting on it, under a substantial shear stress and under a normal compressive stress which does not greatly exceed the minimum principal tectonic stress, and to place the maxiplane, defined as that plane containing the hole axis that has the maximum compressive normal stress acting on it, under a normal compressive stress that substantially exceeds the normal stress on the hypothetical fracture plane; and

(b) pressurizing the surface of the formation which faces the long oriented portion of the hole rapidly over the entire length of said portion with a single continuous pulse of fluid at a pressure sufficient to cause fracturing of the formation.

4,220,206

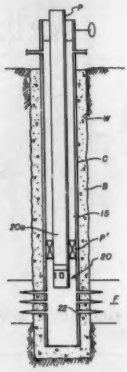
QUICK OPENING CLOSURE ARRANGEMENT FOR WELL COMPLETIONS

Denzal W. Van Winkle, 411 Yorkchester, Houston, Tex. 77079

Filed Jan. 22, 1979, Ser. No. 5,326

Int. Cl.[3] E21B *43/12*

U.S. Cl. 166—318 **13 Claims**



1. A quick opening closure arrangement for controlling flow from a well formation into a tubular member which may be opened by dropping a rod or the like into the tubular member adjacent the earth's surface comprising:

a. closure means for closing off the tubular member from the well formation;

b. sleeve means supporting said closure means to close off flow into the tubular member from the well formation;

c. releasable means releasably securing said sleeve means within the tubular member which releasable means is constructed and arranged to enable said sleeve means to shift longitudinally within the tubular member when the rod dropped into the tubular member impacts thereagainst whereupon the closure means opens the tubular member for flow from the formation; and

d. longitudinally spaced seal means on said sleeve means, one of which seal means is on a larger diameter than the other and responsive to well formation flow to assist in shifting said sleeve means.

4,220,207

SEAFLOOR DIVERTER

Neil W. Allen, Powell, Wyo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 31, 1978, Ser. No. 956,320

Int. Cl.[2] E21B *7/12*

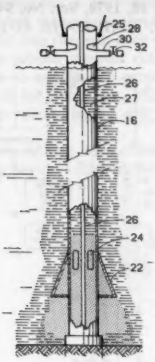
U.S. Cl. 166—367 **7 Claims**

1. A seafloor diverter for use with a riser pipe extending from a subsea well through sea water to a drilling unit on the body of water which comprises:

a pipe section connectable to the lower end portion of said riser pipe and having at least one port means in the wall thereof, and

a diverter means surrounding said port means and sealingly engaging said pipe section at least at the upper end of each said port means and extending down below said port

means to form a flow channel from the interior of said pipe section through said port means to the environment exterior of said pipe section only at a point below said port means.

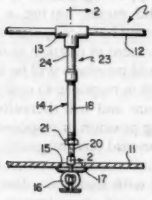


4,220,208

DRY PIPE FIRE EXTINGUISHING SPRINKLER SYSTEM

Jimmy Jackson, Macon, and William D. Roquemore, Musella, both of Ga., assignors to Hays Heating & Plumbing Company, Macon, Ga.

Filed Nov. 21, 197[illegible] Ser. No. 853,798
Int. Cl.[2] A [illegible]C 37/06
U.S. Cl. 169—17 **5 Claims**



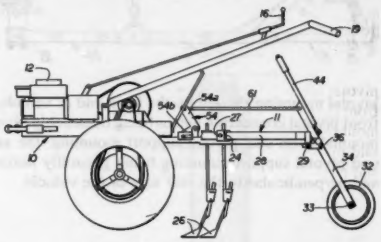
1. In a dry pipe fire extinguishing system having at least one header, a drop nipple and at least one connection having a bore in open communication with a header, the improvement comprising an adapter having a hollow body for connecting the drop nipple to said connection, means for attaching said body to said connection, said body having a projection extending into said connection and including an upper wall having a valve seat means defining an opening, said wall being located above the lowermost portion of the bore of said connection, means for connecting the drop nipple to said body remote from said wall, valve means located within said body, said valve means being mounted on one end of a stem in a position to cooperatively engage and entirely fill said valve seat means, said stem having a length which is less than the le gth of said adapter body, a portion of said valve means extending above said wall when said valve means engages said valve seat means, guide means positioned within said adapter body remote from said valve seat means and having an opening for slidably receiving and guiding said stem, and fluid means for normally urging said valve means into intimate sealing engagement with said valve seat means to prevent the introduction of fire extinguishing medium into said drop nipple.

4,220,209

PLOW WITH IMPROVED TOOL RAISING CONSTRUCTION

William W. Carter, Rte. 1, Brundidge, Ala. 36010

Filed Jun. 5, 1978, Ser. No. 912,300
Int. Cl.[2] A01B *59/044*; B62D *51/04*
U.S. Cl. 172—259 **1 Claim**



1. In a plow adapted to be towed behind a tractor or the like,
(a) a fore and aft extending draw frame having a towing connection at its forward end for attachment to the towing vehicle,
(b) a ground engaging wheel,
(c) an assembly for mounting the wheel adjacent the rear of the draw frame comprising:
(1) an upstanding member carrying an axle adjacent its lower end on which the wheel is journaled,
(2) means connecting the upstanding member for pivotal movement relative to the rear end of the draw frame comprising a quadrant member connected to the rear end of the draw frame, and
(3) manual means for pivoting said upstanding member comprising an upstanding handle, a dog pivoted to the upstanding member and having one end adapted to engage the quadrant, and an operating member for releasing the dog from the quadrant, whereby the rear end of the draw frame may be raised and lowered relative to the ground,
(d) a tool frame disposed transversely of the draft frame located intermediate the rear end of the draft frame and said towing connection,
(e) means pivotally connecting the tool frame for up and down movement relative to the draw frame,
(f) draft members connected to the tool frame and extending rearwardly therefrom tne pivotally connected to the draft frame adjacent the rear end of the latter, and
(g) a link connecting the means set forth in (e) above to the manual means set forth in (c) (3) above, whereby pivoting said upstanding member relative to the draw frame raises or lowers said tool frame relative to the draw frame and hence relative to the ground.

4,220,210

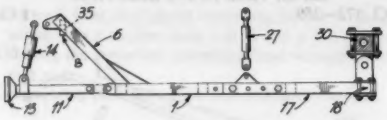
TRACTOR FRONT SUPPORTED IMPLEMENT ATTACHMENT FRAME

Wilfred J. Degelman, Regina, Canada, assignor to Degelman Industries Ltd., Regina, Canada

Filed Oct. 31, 1977, Ser. No. 846,978
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—276 **7 Claims**

1. For detachable mounting on a vehicle such as a tractor having a rear axle frame housing a rear axle, and a pivotal support mounting at the front end of the vehicle, a supporting frame for an implement such as a front-end plow comprising, in combination:
longitudinal frame means extending when mounted between the front end and rear axle of the vehicle;
transversely spaced rear axle hanging means connected to opposed sides of the longitudinal frame means in the vicin-

ity of the rear portion thereof for removably hanging the longitudinal frame means from the rear axle frame; and front pivotal connection means connected to the forward portion of the longitudinal frame means for detachable



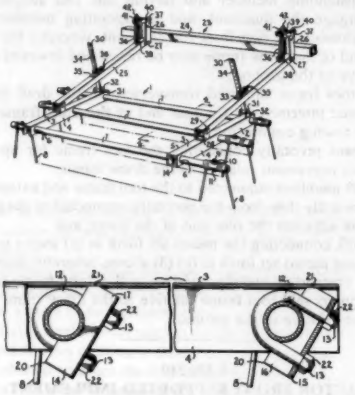
pivotal mounting thereof on the front end of vehicle, said front pivotal connection means being detachably pivotally mountable on said pivotal support mounting, the axis of said pivotal support mounting being generally horizontal and perpendicular to the rear axle of the vehicle.

4,220,211

HARROW WITH TINE STOP THEREFOR

Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Company, Inc., Tipton, Kans.

Filed Jun. 12, 1978, Ser. No. 914,849
Int. Cl.[2] A01B *19/02*
U.S. Cl. 172—618 **13 Claims**



13. In a harrow having hollow draw carrier arms and rotatable transverse tooth carrying shafts mounted on said carrier arms, stop means preventing rotation of said shafts with respect to said arms during normal harrow function and permitting rotation of said shafts through an angle in the opposite direction during harrow back-up, said stop means comprising:

(a) clamp members engaging said shafts and at least partially contained within said carrier arms and contacting said carrier arms to prevent said rotation during normal harrow function;

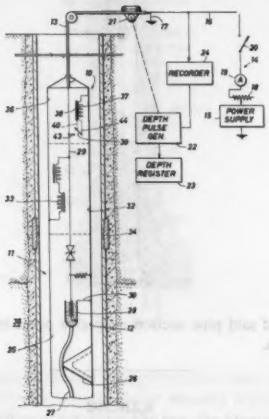
(b) said clamp members including release means selectively releasable for permitting angular adjustment of said brake means about said respective shafts.

4,220,212

APPARATUS FOR MONITORING THE OPERATION OF WELL BORE GUNS

Jack F. Lands, Jr., Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,082
Int. Cl.[3] E21B *43/116, 43/117*
U.S. Cl. 175—4 **27 Claims**



1. Well bore apparatus comprising:

body means;

means on said body means adapted for coupling a detonatable explosive device to said body means; and

means on said body means adapted for cyclically varying the electrical impedance appearing across electrical conductors of a cable supporting said body means and including electrical solenoid means having a coil member and a ferromagnetic member cooperatively arranged and adapted for movement in relation to one another whereby one of said solenoid members will be initially placed in one operating position in response to explosive forces imposed on said body means and will thereafter be moved toward another operating position in response to electromagnetic forces imposed on said ferromagnetic member upon energization of said coil member, and switch means cooperatively associated with said one solenoid member adapted to be closed when said one solenoid member is in its said one operating position for connecting said coil member to electrical-source means and to be opened upon movement of said one solenoid member toward its said other operating position for disconnecting said coil member so that following its said initial placement in said one operating position said one solenoid member will thereafter be moved back and forth between its said operating positions as said coil member is cyclically energized and de-energized.

4,220,213

METHOD AND APPARATUS FOR SELF ORIENTING A DRILL STRING WHILE DRILLING A WELL BORE

Jack E. Hamilton, P.O. Box 686, Hammond, La. 70404

Filed Dec. 7, 1978, Ser. No. 967,386
Int. Cl.[2] E21B *7/08, 7/10*
U.S. Cl. 175—45 **10 Claims**

1. A method of maintaining movement of a rotary drill string and drill bit thereon in a predetermined manner in a well bore comprising the steps of:

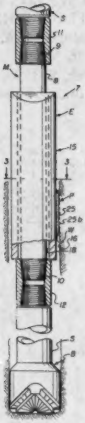
a. instrumentally determining the low side of the well bore;

b. securing on the drill string above the drill bit an eccentric tubular member which accommodates rotational move-

ment between the drill string and the member and which member includes a heavier wall portion with projection means offset circumferentially relative to the heavier wall portion and extending beyond the drill bit diameter for engaging the well bore wall at a position circumferentially spaced from the low side of the well bore to urge the drill bit and drill string in a predetermined manner; and

c. lowering the drill string with the eccentric tubular member and drill bit into the well bore whereupon the heavier portion of the tubular member rotates to the low side of the well bore to engage the projection means with the well bore wall for positioning the drill bit in a desired manner as it is rotated by the drill string to drill the well bore.

3. A self orienting drilling control arrangement for use with a rotary drill string having a drill bit thereon to drill a well bore including:



a. an eccentric member said eccentric member being formed by a tubular member having a longitudinal bore which is eccentric to the longitudinal axis of the member to form a circumferential portion on the member which is heavier than the remainder of the circumferential portion of the member;

b. support means supporting said member in the drill string for relative rotation therebetween;

c. projection means on said member projecting radially beyond the drill bit diameter for contacting the well bore and urging the drill bit in a predetermined manner as the drill string is rotated to drill the well bore; and

d. said projection means being a single longitudinally extending member offset circumferentially a predetermined amount in relation to said heavier circumferential portion.

4,220,214

DIRECTIONAL DRILLING SUB

Lloyd F. Benoit, Rte. 1, P.O. Box 57B, Arnaudville, La. 70512

Filed Aug. 18, 1977, Ser. No. 825,589

Int. Cl.[3] E21B *7/08, 7/04*

U.S. Cl. 175—61 **17 Claims**

1. A method of directional drilling using a rotatable drilling means and drill string comprising the steps of:

(a) providing a directional drilling sub, which sub comprises:

(i) a tool body;

(ii) first connection means on said tool body for attaching said tool body to a drill string;

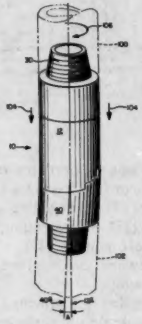
(iii) second connection means on said tool body for attaching a rotating drilling means to said tool body; and

(iv) shifting means associated with said tool body for forming an angular deviation between said first and said second connection means, said deviation producing a deviating angle between a drill string attached to said tool body and a rotating drilling means attached to said tool body;

(b) attaching the sub to the drill string at said first connection means;

(c) attaching the drilling means to the sub at said second connection means;

(d) providing the sub in a first position which substantially aligns the central axes of the drill string and drilling means;



(e) lowering the axially aligned drill string and drilling means with the attached sub into a well hole;

(f) actuating the rotatable drilling means to produce a torsion in the sub to effect a shifting of the sub to a second, angularly deviated position which produces a deviating angle between the axes of the drill string and the drilling means; and

(g) directionally drilling with the drilling means.

4,220,215

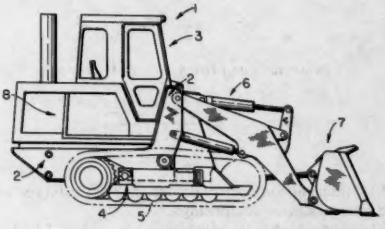
A-FRAME FOR CARRYING LOADS ON A LOADER

Sheldon L. Stark, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 813,724, Jul. 7, 1977, abandoned. This application Jul. 26, 1979, Ser. No. 60,708

Int. Cl.[2] B62D *11/00*

U.S. Cl. 180—6.7 **5 Claims**



1. In a main frame for a loader vehicle having a triangular upright plate including a first forward leg, a second bottom leg and a third rear leg, the improvement comprising:

(a) a plurality of first plates being shaped to provide a first box section along said first leg;

(b) a plurality of second plates being shaped to provide a second box section along said second leg;

(c) at least one third plate extending substantially at a right angle to said third leg; and

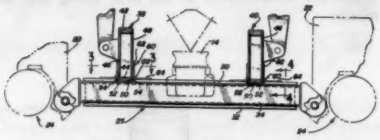
(d) a plurality of fourth plates being shaped to provide a third box section with said third plate.

4,220,216

WELD JOINT HARDBAR MAIN FRAME

Robert F. Ringness, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 2, 1979, Ser. No. 14,017
Int. Cl.[2] B62D *55/00*
U.S. Cl. 180—9.5 9 Claims



1. A welded frame support structure, comprising:

a support member (**25**) having a top surface (**30**),

a frame member (**38,40**) engaging said top surface (**30**) of said support member (**25**) and extending at substantially right angles to said support member (**25**),

welds (**54**) between said support member (**25**) and frame member (**38,40**), and;

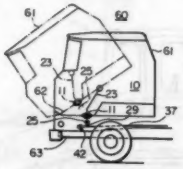
flexible plate means (**60**) attached to the side of said frame member (**38,40**) and said top surface (**30**) of said support member (**25**) and positioned such that said flexible plate means (**60**) bridges said weld between said support member (**25**) and frame member (**38,40**) and having no weld between said flexible plate means (**60**) and support member (**25**) and frame member (**38,40**) along said bridged portion.

4,220,217

TRANSMISSION CONTROL DEVICE FOR TILT CAB TYPE VEHICLE

Kuniaki Kobayashi, c/o Hino Kojo of Hino Tidasha Kogyo Kabushiki Kaisha 3-1-1, Hinodai, Hino-shi, Tokyo, Japan

Filed Aug. 29, 1978, Ser. No. 938,311
Claims priority, application Japan, Sep. 14, 1977, 52/124059[U]; Sep. 14, 1977, 52/124060[U]; Jul. 19, 1978, 53/99252[U]
Int. Cl.[2] B62D *33/06*
U.S. Cl. 180—328 11 Claims



1. A transmission control device for a tilt cab type vehicle, said control device comprising:

a bearing which is mounted on the cab floor of said vehicle and having a bearing bore therein;

a change lever extending downwardly through said bearing bore and having a bearing portion engaged in said bearing bore and being supported therein for pivoting movement in any direction;

yoke means attached to the lower end of said change lever and having a pair of downwardly open openings therein transversely spaced relative to the axis of said change lever and aligned with each other;

a neutral positioning spring attached to said change lever for maintaining said change lever in substantially a neutral position when said cab is tilted and thereby maintaining said yoke in said substantially neutral position;

a shift selection lever below said yoke means and having a ball on the upper end thereof;

an arm pin having a socket therein in which the ball on said shift selection lever is frictionally fitted, said arm pin extending transversely of said shift selection lever and engaging in said aligned openings in said yoke for connecting said change lever and said shift selection lever when said cab is in a normal horizontal position and said yoke means being disengaged from said arm pin when said cab in tilted; and

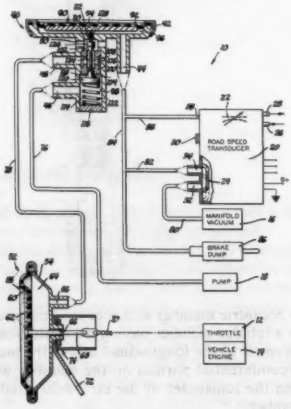
a control rod on the vehicle chassis and connected to the lower end of said shift selection lever for connecting said shift selection lever to the transmission.

4,220,218

VEHICLE ROAD SPEED CONTROL SYSTEM WITH FLOW AMPLIFIER

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 9, 1979, Ser. No. 10,610
Int. Cl.[3] B60K *31/00*
U.S. Cl. 180—176 2 Claims



1. A vehicle road speed control system for a vehicle having an engine provided with an intake manifold acting as a source of subatmospheric pressure, and a source of superatmospheric pressure, said system comprising:

a selectively activated vehicle road speed transducer arranged to receive an actual vehicle road speed signal, a desired vehicle road speed signal, subatmospheric pressure from said manifold and atmospheric air pressure, said transducer when activated generating a subatmospheric control pressure from said received pressures and signals;

a flow amplifier arranged to receive atmospheric air pressure, superatmospheric pressure from said source and said subatmospheric control pressure from said transducer, said flow amplifier generating a superatmospheric control pressure from the atmospheric pressure and superatmospheric pressure received by it in accordance with said subatmospheric control pressure;

a servomotor having a power wall arranged to receive atmospheric air pressure and said superatmospheric control pressure on opposite power wall sides to move and position said power wall in respone to changes in said superatmospheric control pressure;

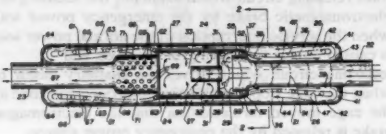
and vehicle engine control means arranged to be controlled by movement of said power wall so that the actual vehicle speed is maintained substantially at the desired vehicle speed while said transducer is activated.

4,220,219

LIGHTWEIGHT MUFFLER AND METHOD FOR MUFFLING NOISE

Ray T. Flugger, 4810 Roblar Rd., Petaluma, Calif. 94952

Filed Sep. 14, 1978, Ser. No. 942,406
Int. Cl.[2] F01N *1/08*
U.S. Cl. 181—265 **10 Claims**



1. A lightweight small diameter muffler for internal combustion engines or the like including an outer elongated imperforate casing, an inlet tube mounted to said casing and extending internally thereof for the flow of exhaust gases into said muffler, an outlet tube mounted to said casing and extending therefrom for the flow of said gases from said casing, a cup-like partition means mounted inside said casing for discharge of gases from said inlet tube into said cup-like partition means, said casing and said inlet tube defining an annular elongated expansion chamber in said casing proximate and in flow communication with said cup-like partition means for discharge of gases from said cup-like partiton means into said chamber, and passageway means from said chamber to said outlet tube, wherein the improvement in said muffler comprises:

said inlet tube being imperforate;

said cup-like partition means and said inlet tube being formed to provide an annular nozzle for discharge of gases into said chamber in an annular first stream portion directed against and along the outside surface of said inlet tube;

said casing being formed with an inside surface parallel to said outside surface of said inlet tube over substantially the entire length of said chamber, and said casing being formed with a flow reversal surface at an end of said chamber remote from said cup-like partition means, said flow reversal surface extending radially from a position proximate said inlet tube to a position proximate said inside surface of said casing wall and being formed for controlled flow of said gases in a stream from said annular first stream portion to an annular second stream portion moving along said inside surface of said casing in an opposite direction and concentric with said annular first stream portion, said chamber being further formed for concentric side-by-side flow in said chamber of said first annular stream portion and said second annular stream portion without partition means interposed in said chamber between the stream portions.

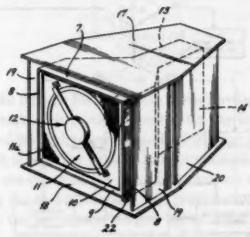
4,220,220

LOUDSPEAKER EQUIPMENT

Warren Ripple, 3345 Marko St., Sarasota, Fla. 33580

Continuation-in-part of Ser. No. 886,991, Mar. 16, 1978, Pat. No. 4,161,230, which is a continuation of Ser. No. 687,353, May 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 615,364, Sep. 22, 1975, abandoned. This application Mar. 21, 1979, Ser. No. 22,434
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—148 **4 Claims**

1. Loudspeaker equipment comprising a speaker, a speaker enclosure having enclosure walls defining a speaker chamber having front and rear intercommunicating compartments, the front compartment being generally rectangular and having a rectangular front wall with an opening therein with the speaker mounted thereon and exposed through the opening, the side walls of the front compartment defining a generally rectangular compartment space, the rear compartment having one dimension equal to one dimension of said front wall and having a dimension perpendicular to the first dimension substantially smaller than the first dimension, two opposite side walls of the front compartment having rearward extensions of smaller width than said two side walls and serving as side walls of the rear compartment, and the rear compartment having additional walls of the same dimension as the other two of the side walls of the front compartment cooperating with said extensions in defining a generally rectangular rear compartment space, one transverse dimension of which is substantially smaller than the corresponding dimension of the front compartment and the other transverse dimension of which is substantially equal to the corresponding dimension of the front compartment, the enclosure walls being at least in large part formed of thin sheet material capable of excitation and consequent sound generation under the influence of the speaker at least at frequencies in the lower portion of the audio range, and a reflector in which the speaker and its enclosure are positioned, the reflector having an opening at the front through which the speaker is exposed, said opening being larger than



the front compartment of the speaker enclosure to provide clearance at all sides of the speaker enclosure, the reflector being formed of horizontal and vertical wall elements, the horizontal wall elements comprising top and bottom wall elements vertically spaced from each other to receive the speaker enclosure therebetween, and the vertical wall elements comprising side wall elements, said top, bottom and side reflector wall elements being positioned and spaced to define the front opening of the reflector through which the speaker is exposed, the side wall elements of the reflector including a plurality of elements at each side with adjacent edges spaced from each other, and said plurality of elements of the reflector further including elements toward the rear of the reflector at opposite sides thereof at least a portion of which are spaced from each other a distance substantially less than the spacing of the side wall elements of the reflector at the front opening of the reflector, the side wall elements of the reflector being spaced from each other sufficiently to provide clearance at the side walls of the speaker enclosure.

4,220,221

METHOD AND APPARATUS FOR PRODUCING A SPEED PATTERN FOR AN ELEVATOR CAR OR SIMILAR VEHICLE

John A. Gingrich, Toronto, Canada, assignor to Dover Corporation, New York, N.Y. and Dover Corporation (Canada) Limited, Toronto, Canada

Filed Feb. 2, 1977, Ser. No. 764,712
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **57 Claims**

1. A method for controlling the speed of a vehicle movable between a plurality of stopping positions, said method comprising the steps of:

(a) setting the contents of a main register, designated as a first variable (MR), equal to a digital number representing a target distance (TD) between the present position of the vehicle and a selected stopping position;

(b) setting the contents of a step counter, designated as a

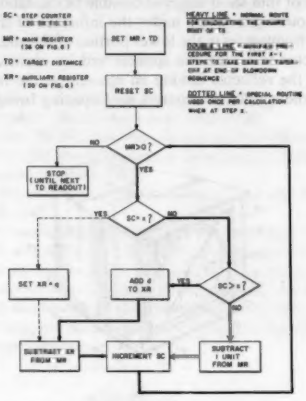
second variable (SC), equal to a digital number representing an initial integer (1, 2, . . . x);

(c) setting the contents of an auxiliary register, designated as a third variable (XR), equal to a digital number representing a first constant (q);

(d) digitally subtracting the contents of the auxiliary register, said third variable (XR), from the contents of the main register, said first variable (MR);

(e) digitally adding a digital number representing a second constant (d) to the contents of said auxiliary register, said third variable (XR);

(f) incrementing said step counter, and hence said second variable (SC), by one unit;



(g) determining whether the contents of said main register, said first variable (MR), has been reduced to zero or less;

(h) if said first variable (MR) is greater than zero, returning to step (d);

(i) if said first variable (MR) is zero or less than zero, producing a speed pattern signal in the form of a pulse whose width is substantially proportional to the contents of said step counter, said second variable (SC); and

(j) repeatedly carrying out steps (a)–(i); while

(k) controlling the vehicle speed in accordance with said speed pattern signal.

4,220,222

AUTOMATIC LANDING APPARATUS IN SERVICE INTERRUPTION

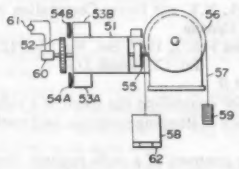
Hiroshi Kamaike, and Hideo Uchino, both of Inazawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 925,532

Claims priority, application Japan, Jul. 18, 1977, 52-85814; Aug. 17, 1977, 52-98353; Nov. 7, 1977, 52-133191

Int. Cl.[2] B66B 5/02

U.S. Cl. 187—29 R **12 Claims**



1. An automatic landing apparatus in service interruption which comprises:

an electromagnetic brake which is released to release a main motor for driving a cage;

an auxiliary motor which is equipped together with the main motor to drive the cage;

an emergency power source which has a power for releasing the electromagnetic brake and driving the auxiliary motor;

a brake releasing circuit which maintains the releasing of the electromagnetic brake by the emergency power source when the service interruption of the normal power source is caused during the driving of the cage; and

a restarting circuit which drives the auxiliary motor only when the cage stops outside the door openable zone after the cage moved on condition that the electromagnetic brake is released by the emergency power source.

4,220,223

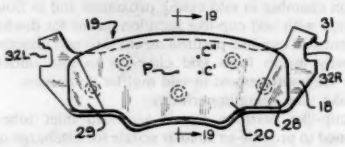
SLIDING CALIPER DISC BRAKE FRICTION PAD ASSEMBLIES

Kurt H. Rinker, Ann Arbor, and Anthony C. Evans, Westland, both of Mich., assignors to Kelsey Hayes Co., Romulus, Mich.

Filed Aug. 1, 1978, Ser. No. 928,475

Int. Cl.[3] F16D 69/00

U.S. Cl. 188—73.1 **3 Claims**



1. A brake pad assembly having self-adjusting characteristics for correcting uneven wear of the frictional surface for use in a vehicular disc brake having a brake rotor, said brake pad assembly comprising, a rigid backing plate, a pad of frictional material attached thereto having a circumferentially symmetrical central friction surface area for engaging the brake rotor, said frictional surface area having its center of pressure coincident with the surface area centroid, means for unsymmetrically increasing said central frictional surface area, should uneven wear of said surface occur, thereby displacing the area centroid toward the region of uneven wear and causing an increase in the surface pressure loading over the unaffected region of the frictional surface area and a corresponding increase in the wear rate of said unaffected region so as to return said frictional surface area to its original circumferentially symmetrical configuration and re-position the friction surface area centroid to its original coincident relationship with the center of pressure thus restoring uniform pressure loading of the friction pad.

4,220,224

DISC BRAKE

Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Dec. 22, 1978, Ser. No. 972,486

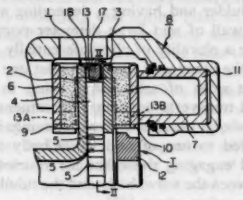
Claims priority, application Japan, Jan. 5, 1978, 53-335

Int. Cl.[2] F16D 65/02

U.S. Cl. 188—73.3 **3 Claims**

1. A disc brake comprising a rotatable disc having a circumferential groove in the periphery thereof, a pair of friction pads disposed on opposite sides of said disc, a stationary supporting member having a pair of arm portions spaced from each other in the direction of the circumference of said disc, said arm portions extending respectively in the direction of the axis of the disc and straddling the periphery of the disc, said friction pads being slidably mounted on said arm portions, a caliper slidably mounted on the stationary member, a beam integral with the stationary member rigidly interconnecting said arm

portions, at least a portion of said beam being within said circumferential groove in the periphery of the disc with a clearance between said beam and the inner surfaces of said groove.



4,220,225

DISC BRAKE

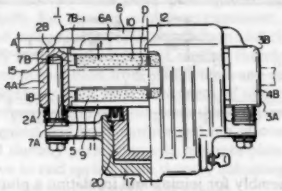
Kinzo Kobayashi, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Jun. 7, 1978, Ser. No. 914,745

Claims priority, application Japan, Jun. 16, 1977, 52-78666

Int. Cl.[2] F16D *65/02*

U.S. Cl. 188—73.6 **2 Claims**



1. A disc brake comprising:

a disc;

a caliper holder adapted to be secured to a nonrotatable part of a vehicle;

a first pair of arm portions on said caliper holder, said arm portions of said first pair being spaced with respect to each other on one side of said disc and located radially inward from the outer circumference of said disc and extending in a generally radial direction with respect to said disc;

a second pair of arm portions on said caliper holder, said arm portions of said second pair being spaced from said first pair of arm portions in the axial direction and adjacent to the other side surface of said disc, said second pair of arm portions extending in a generally radial direction with respect to said disc;

backing plates mounted on said first and second pairs of arm portions for movement toward and away from said disc and having friction pads on the surface thereof facing said disc and terminating short of the portion of the backing plates mounted on said arm portions;

bridge means located outside the circumference of said disc, and extending across the disc in an axial direction relative to said disc, and rigidly connecting respectively the generally radially extending corresponding outer ends of said arm portions of said first and second pair of arm portions;

an inner beam disposed on one side of said disc and connecting said first pair of arm portions; and

an outer beam disposed on the other side of said disc and connecting said second pair of arm portions at respective radially inner ends of said second pair of arm portions, said outer beam having an arcuate shape and having the central portion of said outer beam positioned radially outside an imaginary line between the ends of said outer beam, said outer beam additionally being spaced in an axial direction relative to the disc away from said second pair of arm portions by a distance greater than the thickness of said backing plates and said outer beam overlapping, when viewed in the direction of the axis of said disc, said backing plate which is adjacent to said outer beam.

4,220,226

BRAKE DEVICE FOR A FRICTION PRESS

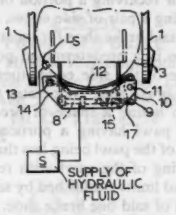
Shigeo Iwasaki, and Hiroshi Haguchi, both of Okayama, Japan, assignors to Mitsuishi Fukai Tekkosho, Okayama, Bizenshi, Japan

Filed Oct. 18, 1978, Ser. No. 952,540

Claims priority, application Japan, Oct. 28, 1977, 52/144702

Int. Cl.[2] F16D *51/06*

U.S. Cl. 188—77 R **4 Claims**



1. A brake device for a friction press having a flywheel on a threaded shaft with a press member on the lower end thereof, the flywheel being between a pair of friction discs rotated on a shaft which is movable in the direction of its length for bringing one or the other of the discs into contact with the flywheel for driving the threaded shaft and press member up and down, said brake device comprising a brake band generally in the shape of an arc and which is engagable with the circumference of the flywheel at a circumferential position between the friction faces of the friction discs and having a transverse dimension sufficient to contact said flywheel at all positions in the up and down movement of the flywheel in the threaded shaft, spring means connected to said brake band for normally tensioning said brake band to decrease the curvature of the arc for urging said brake band into contact with the flywheel, and releasable disengaging means usually acting on said brake band to prevent application of tension thereto to hold it out of contact with the flywheel against the action of said spring means, but whereby when necessary said disengaging means is actuated to release said spring means quickly and tension the brake band to engage it with said flywheel.

4,220,227

DRUM BRAKE AUTOMATIC ADJUSTER

Michael A. Kluger, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 26, 1978, Ser. No. 973,370

Int. Cl.[3] F16D *65/56*

U.S. Cl. 188—196 BA **5 Claims**

1. In a drum brake assembly, a rotatable brake drum, a pair of brake shoes mounted adjacent said drum and movable into frictional engagement therewith when a brake application is effected, an extendible strut between said brake shoes for limiting movement of the brake shoes away from the drum when the brake is released, a pawl cooperating with said extendible strut to extend the latter to compensate for wear of the brake shoes to thereby maintain a substantially constant clearance

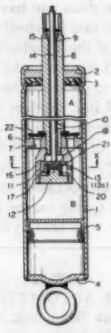
between the shoes and the drum, a resilient member yieldably urging the brake shoes toward their retracted position engaging said strut, a pivot pin securing said pawl to one of said brake shoes, said pivot pin having larger and smaller portions with a shoulder therebetween to engage said brake shoe when said smaller portion is installed thereon, said pivot pin having a flange, said larger portion cooperating with the shoulder and said flange to define a gap therebetween, said pawl being pivotally mounted in a first plane on said larger portion of the pivot pin, said gap being wider than the thickness of the pawl to permit the latter to tilt relative to the pivot pin in a second plane at an angle relative to said first plane, said resilient member engaging the pawl to impart rotation and tilt to the pawl in said first and second planes, respectively, said extendible member having a slot for receiving a portion of one of said brake shoes, said slot having a pair of side edges, and means carried by said slot and by said brake shoe for locating said portion of said one brake shoe in a predetermined position in said slot with respect to one of the side edges thereof whereby said portion of said one brake shoe cooperates with said one side edge of the slot to define a space of predetermined width therebetween, said pawl having a portion received in said space, the thickness of the pawl being less than the width of the space to permit tilting of the pawl with respect to the strut within predetermined limits established by said one edge of the slot and the portion of said one brake shoe.

4,220,228

HYDRAULIC DAMPER

Tetuo Kato, Musashino, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Jan. 31, 1979, Ser. No. 8,342
Claims priority, application Japan, Feb. 6, 1978, 53-13499[U]
Int. Cl.[2] F16F *9/34*
U.S. Cl. 188—319 **1 Claim**



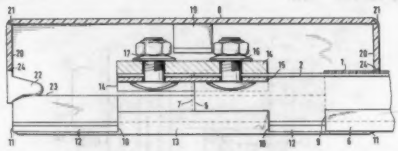
1. A hydraulic damper comprising: a cylinder containing oil therein; a piston slidably fitted in said cylinder; a hollow piston rod extending from one side of said piston and projecting out of said cylinder and extending through said piston, said hollow piston rod having a transverse opening on said one side of said piston; a tubular member having a stepped bore with a small diameter portion adjacent said piston and a large diameter portion remote from said piston and a shoulder therebetween, and said larger diameter portion having a wall therearound, said tubular member having one end threaded to the end of said piston rod on the other side of said piston for closing said small diameter portion and securing said piston to said piston rod and with the interior of said tubular member in communication with the interior of said hollow piston rod; a plug closing the end of the larger diameter portion of said tubular member; an actuating rod rotatably extending from within said tubular member through said piston and through said hollow piston rod and having a diameter less than the internal diameter of said hollow piston rod for leaving an annular space around said actuating rod, said actuating rod being operable from outside of said cylinder for rotating it; a valve body having an apertured disc-shaped bottom rigidly connected to the end of said actuating rod within said tubular member and slidably contacting said shoulder and having a depending side wall slidable against the wall of said large diameter portion, one of said walls having a plurality of circumferentially spaced openings therein and the other wall having at least one opening therein, the opposite sides of said piston being in communication through said transverse opening, said annular space, the interior of said tubular member and said openings in said walls; and a stop secured to one of said valve body and said tubular member and engaging the other for restricting the relative rotation between the valve body and the tubular member to an angle not exceeding about 180°.

4,220,229

INSULATIVE SUPPORT FOR CONDUCTIVE RAIL ASSEMBLY

Manfred Wampfler, Weil, Fed. Rep. of Germany, assignor to Wampfler GmbH, Fed. Rep. of Germany

Filed May 23, 1978, Ser. No. 908,882
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739482
Int. Cl.[3] B60M *1/18, 1/34, 1/24*
U.S. Cl. 191—39 **16 Claims**



1. An assembly for joining and insulating a plurality of electrically-charged rail sections to provide electrical power to a trolley or the like and comprising:

a plurality of insulative members each enclosing a surface portion of a separate rail section with each insulative member having an axial length which is less than an axial length of a respective rail section enclosed by said insulative member to allow for relative thermal expansion or contraction;

a plurality of spaced, junction hood assemblies arranged for supporting end portions of adjacent rail sections and adjacent insulative members;

wherein each of said junction hood assemblies is formed from a single piece and include opposed open end portions, each of which is closed by a capping member which is pivotally hinged to each of said junction hood assemblies and which is pivotable into said open end portion;

each of said junction hood assemblies further including means for allowing movement of said insulative members while ensuring insulative coverage of portions of said rail sections extending between adjacent junction hood assemblies.

4,220,230

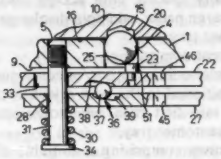
OVERLOAD RELEASE CLUTCH

Quinten A. Hansen, Highway 38, Franksville, Wis. 53126

Filed Mar. 30, 1979, Ser. No. 25,359
Int. Cl.[3] F16D *43/20*
U.S. Cl. 192—56 R **5 Claims**

1. An overload release clutch comprising: a body rotatable about an axis and having a transverse surface, said body also having a series of circumferentially spaced holes extending in an axial direction and through said surface, a rotor rotatably mounted about said axis and adjacent said body and having a plurality of detents, one detent for each of said holes in said body, said detents being circumferentially alignable with the

holes in said body when said clutch is engaged, a ball in each of said holes and engagable in said detents and forming torque transmitting means between said body and rotor, a spring plate, means for shiftably mounting said spring plate to said body, spring means acting between said mounting means and said spring plate for resiliently urging said spring plate towards said body, a pressure plate shiftably mounted on said mounting means and adjacent said transverse surface of said body, said pressure plate located between said body transverse surface and said spring plate, said pressure plate having pins extending into said body holes for off-center engagement with said balls; and cam means between said pressure plate and said spring plate whereby relative rotation between said plates causes



variation in the distance between said plates, said spring means bearing against said spring plate and acting through said cam means to urge said pressure plate pins against said torque transmitting balls for causing clutch engagement; whereby when excessive torque loads are imposed upon said clutch, said rotor and body rotate relative to one another thereby causing axial movement of said balls from said detents and consequent clutch disengagement, said axial movement of said balls causing axial movement of said pins out from their respective holes and to bear against said body surface and out of contact with said balls, and thereby permitting said pressure plate to rotate slightly relative to said spring plate thereby actuating said cam means to cause disengagement of said clutch.

4,220,231

DRIVE MECHANISM

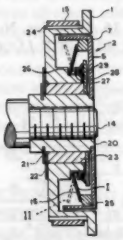
Gerhard Richter, Wuppertal, and Klaus Stein, Velbert, both of Fed. Rep. of Germany, assignors to Vorwerk & Co Interholding GmBH, Wuppertal, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,053

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744929

Int. Cl.[3] F16D *43/25*

U.S. Cl. 192—82 T **12 Claims**



1. A drive mechanism, particularly for household appliances, comprising a driving element; a driven element concentric with said driving element; and means for frictionally transmitting motion between said elements, comprising a dished spring fixedly connected to one of said elements and in direct frictional contact therewith the other of said elements whereby to normally transmit motion directly between said elements, said spring being of a material which deforms upon heating so that relative motion between said elements resulting in direct frictional heating of said dished spring causes the same to deform abruptly out of engagement with said other element and thereby interrupt the transmission of motion between the elements.

4,220,232

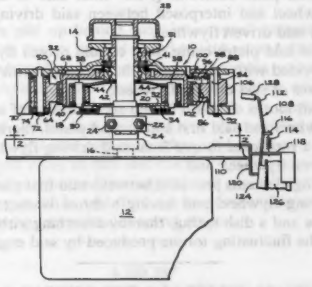
TWO-SPEED DRIVE

Robert M. Fey, and Hiriyur V. Shekar, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 2, 1978, Ser. No. 930,487

Int. Cl.[2] F16D *43/24*

U.S. Cl. 192—103 B **13 Claims**



1. A two-speed clutch comprising:

a rotatably mounted input member;

a rotatably mounted output member aligned with the input member;

a clutch shoe assembly mounted on said output member, said clutch shoe assembly having one end thereof pivotally secured to the output member and the other end free and including a clutching surface carried by said free end engageable with said input member and movable into frictional clutching engagement with said input member upon radial inward movement about said pivotal securement;

means biasing said clutch shoe into said frictional clutching engagement with said input member;

an auxiliary weight mounted on said output member, said auxiliary weight having one end thereof pivotally secured to the output member and the other end free and movable in response to centrifugal force generated by rotation of said output member;

means causing said auxiliary weight to come into engagement with a portion of said clutch assembly at the free end thereof upon rotation about said pivotal securement at said predetermined speed to exert a centrifugal force on said clutch shoe in a direction opposite said means biasing force to effect clutching surface slippage with respect to the input member upon development of sufficient disengagement force corresponding to the torque transmitted through said clutch;

control means operable to alternatively restrain or free said auxiliary weight to move about said pivotal securement to either prevent or allow said movement, whereby said output member is driven either at the same speed of said input member or at said predetermined reduced speed.

4,220,233

CLUTCH ASSEMBLY FOR USE WITH AN INTERNAL COMBUSTION ENGINE

Hiroshi Ban, Toyota; Hideichi Hori, Tokai; Ryoichi Kudo, and Akio Yoshida, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jun. 16, 1978, Ser. No. 916,113

Claims priority, application Japan, Jun. 16, 1977, 52/71450

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.2 **5 Claims**

1. A flywheel assembly for use with an internal combustion engine comprising,

a driving flywheel drivingly connected to said internal combustion engine and provided with recess means, said driving flywheel having a boss portion;

a flanged bush fitted on said boss portion of said driving flywheel;

a driven flywheel rotatably mounted on, and co-axially positioned by, said flanged bush;

a first plate confronting one side of said driving flywheel at the side of said engine;

a second plate confronting the other side of said driving flywheel and interposed between said driving flywheel and said driven flywheel;

each of said plates being fixed to said driven flywheel and provided with recess means in alignment with said recess means of said driving flywheel;

resilient means disposed in said recess means of said driving flywheel and said first and second plates, thereby imparting a rotational torque from said driving flywheel to said driven flywheel; and

damping elements provided between said first plate and said driving flywheel and having a thrust washer, a friction plate and a dish spring, thereby absorbing virbration due to the fluctuating torque produced by said engine.

4,220,234

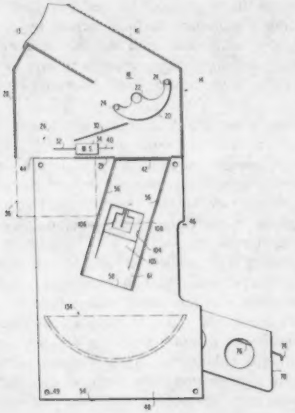
SUPPLEMENTAL COIN ACCEPTOR/REJECTOR MECHANISM FOR COIN OPERATED MACHINES

Russell G. Sheltra, Sr., 14101 Mt. Charleston, Reno, Nev. 89507

Filed Mar. 20, 1979, Ser. No. 22,135

Int. Cl.[3] G07F *5/16*

U.S. Cl. 194—1 G **5 Claims**



1. A supplemental coin acceptor/rejector mechanism for a coin operated vending machine or the like, said machine comprising:

a machine casing,

a first coin acceptor/rejector mechanism,

a coin receiver opening within said machine casing,

a coin receiver leading from said casing coin receiver opening to said first coin acceptor/rejector mechanism,

a customer tray within said casing, below said first coin acceptor/rejector mechanism and opening to the machine exterior to permit return to the vendee of non-accepted coins passing through said first coin acceptor/rejector mechanism from said coin receiver,

a coin acceptor/rejector member within said first coin acceptor/rejector mechanism and positioned in the path of coins entering said coin acceptor/rejector mechanism through an opening therein, from said coin receiver and acting to separate normally acceptable coins from non-acceptable coins and for discharge of coins respectively along laterally spaced, coin accept discharge and coin reject discharge paths, said coin discharge path leading to said customer tray;

the improvement comprising:

a supplemental coin acceptor/rejector mechanism operatively positioned in the coin reject discharge path and between said first coin acceptor/rejector mechanism and said customer tray,

said mechanism comprising a shiftable chute having an opening sized to receive rejected coins which are of the same value but different size and weight from the normally accepted coins and smaller diameter coins and forming a gravity flow on-edge coin path for the rejected coins received through said chute opening,

a coin reject window within said chute,

means for causing coins smaller in diameter than said same value, different size and weight coins to be rejected from the chute through said window and for passage to said customer tray,

said chute further including means sensing the passage of said same value, different sized and different weight coins through said chute, downstream of said coin reject window, and

means responsive to operation of said sensing means for shifting said chute between a first position where said chute opening is in line with the discharge path for rejected coins from the first coin acceptor/rejector mechanism to a second position where said chute opening lies outside of said path, and wherein said rejected coins from said first coin acceptor/rejector mechanism pass directly to said customer tray.

4,220,235

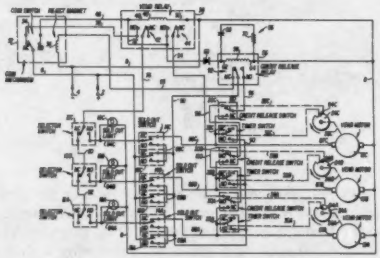
VENDING MACHINE CONTROL CIRCUIT INCLUDING CREDIT RELEASE RELAY

James C. Lindsey, Chattanooga, and Gregory S. Morgan, Ooltewah, both of Tenn., assignors to Cavalier Corporation, Chattanooga, Tenn.

Filed Feb. 16, 1979, Ser. No. 12,865

Int. Cl.[3] G07F *11/00*

U.S. Cl. 194—10 **5 Claims**



1. A control circuit for a vending machine having a plurality of sources of articles adapted to be selectively dispensed and a plurality of vend motors, each vend motor corresponding to a separate source and arranged to dispense an article from the

corresponding source when energized according to the choice of a customer, said control circuit comprising:

a vend relay;

means for establishing a holding circuit for said vend relay upon energization thereof;

a vend switch connected to momentarily energize said vend relay upon insertion of money;

a credit release relay;

means for energizing said credit release relay when said vend relay is energized;

a customer-operable selector switch for each article source, said selector switches being supplied with power when said vend relay is energized, and each of said selector switches connected to energize the corresponding vend motor when operated while supplied with power;

a credit release switch for each vend motor arranged to be actuated by its corresponding vend motor between a first and a momentary second position shortly after initial energization of the corresponding vend motor by the corresponding selector switch, each credit release switch being supplied with power when said credit release relay is energized, and each credit release switch having contacts arranged in the first position to energize said vend relay holding circuit, and arranged in the momentary second position to interrupt said vend relay holding circuit and to maintain energization of the corresponding vend motor while supplied with power, and at least one of said credit release switches in its momentary second position interrupting the supply of power to at least one other credit release switch which may also be in its second position;

a timer switch for each vend motor arranged to be actuated by its corresponding motor from a first to a second position during the interval the corresponding credit release switch is in its momentary second position to maintain energization of the corresponding vend motor, and to be actuated from the second to the first position at the end of an article vend cycle, each timer switch having contacts arranged in the second position to maintain energization of the corresponding vend motor and arranged upon return to the first position to de-energize the corresponding vend motor; and

time delay means for maintaining said credit release relay energized for a predetermined time interval after said at least one credit release switch interrupts the supply of power to said other credit release switches and interrupts said vend relay holding circuit to de-energize said vend relay, the predetermined time interval being at least long enough for the corresponding one timer switch to switch to its second position and maintain energization of the corresponding vend motor, and short enough such that said credit release relay is de-energized thus removing the supply of power from all credit release switches before the vend motor corresponding to any of said other credit release switches is energized sufficiently long enough to cause the corresponding other timer switches to switch to their second position in the event any of said other credit release switches is in its second position, whereby delivery of only one article per vend switch operation is ensured.

4,220,236

APPARATUS FOR CONVEYING AND TEMPORARY STORAGE OF CIGARETTE PACKS OR THE LIKE

Otto Blidung, Geesthacht, and Gerhard Tolasch, Wentorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

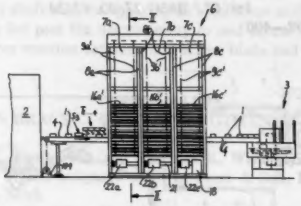
Filed Dec. 20, 1978, Ser. No. 971,527

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800570

Int. Cl.³ B65G *1/00*

U.S. Cl. 198—347 **14 Claims**

1. Apparatus for temporary storage of rows of discrete commodities which are transported by a conveyor in a predetermined direction along a predetermined path from a supplying to a processing station, comprising a storing unit having at least one magazine adjacent to a predetermined section of said path and including means for transferring rows of commodities from and back into said section; a first blocking device located at the downstream end of said section and movable into said path to intercept an oncoming commodity whereby the next-following commodities pile up behind the intercepted commodity to form a growing row; a second blocking device located ahead of said section and movable into said path to intercept an oncoming commodity whereby the next-following



commodities pile up behind such intercepted commodity; a third blocking device located ahead of said second device and movable into said path to arrest an oncoming commodity; means for counting the number of commodities which are piled up by said second device; and means for respectively moving said second and third devices substantially simultaneously from and into said path when said number reaches a predetermined value so that said conveyor is free to transport such number of commodities beyond said second and toward said first device while said third device prevents commodities from advancing toward said second device.

4,220,237

BOTTLE CARRIER FOR A LABELING MACHINE

Hans-Werner Mohn, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg Werke Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 6, 1978, Ser. No. 939,932

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740657

Int. Cl.² B65G *29/00, 47/24*

U.S. Cl. 198—377 **5 Claims**

1. In a bottle carrier for a labeling machine having a plurality of bottle plates which are rotated about their own axes by a drive as the bottle carrier rotates, the drive being controlled by a control arm guided in a fixed cam, the improvement wherein each bottle plate has a drive shaft connected thereto and about which the bottle plate rocks, a socket in the bottle carrier for each drive shaft and a friction wheel drive disposed between each drive shaft and the corresponding socket and including a

cage to which the control are directly transmits the rocking movements prescribed by the cam.

4,220,238
APPARATUS FOR ARRAYING RANDOMLY DISTRIBUTED OBJECTS

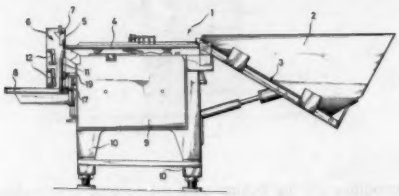
Henri Shavit, Arlesheim, Switzerland, assignor to Rondo, A.G., Allschwill-Basel, Switzerland

Filed Nov. 4, 1977, Ser. No. 848,748

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651664

Int. Cl.³ B65G *27/00, 47/24*

U.S. Cl. 198—400 **27 Claims**



1. In an apparatus for arrying randomly distributed elongated objects of at least two types each having a different cross-section, the combination of a substantially continuously driven feeding conveyor having an upper side provided with at least one elongated groove for reception and transport of the elongated objects therein with the longitudinal axes of the objects oriented longitudinally of the groove, said conveyor having a discharge end toward and beyond which the elongated objects are advanced; a support, an upright duct having an upper end arranged to receive the elongated objects which advance beyond said discharge end and defining an elongated passage wherein the elongated objects descend with the longitudinal axes thereof extending longitudinally of the passage, said duct comprising at least two sections bounding said passage, of said sections including two discrete portions one of which is located below the other, and means for fastening said portions to each other for adjustment of said one portion relative to said other portion in the longitudinal direction of said duct; and means for securing said sections to said support for adjusting movement of at least said one section toward and away from the other section between at least two different positions in one of which said passage has such transverse dimensions that it can guidingly receive and permit the longitudinal descent of one of the types of the elongated objects having a first cross-section, and in the other of which said passage has such transverse dimensions that it can guidingly receive and permit the longitudinal descent of the other type of the elongated objects having a second cross-section.

4,220,239
TRANSFER AND INVERTER MACHINE

Guy Prichard, Jr., Enterprise, Kans., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 27, 1978, Ser. No. 928,642

Int. Cl.² B65G *47/24*

U.S. Cl. 198—403 **4 Claims**

1. A machine with which to invert a body with a thin flat configuration including,

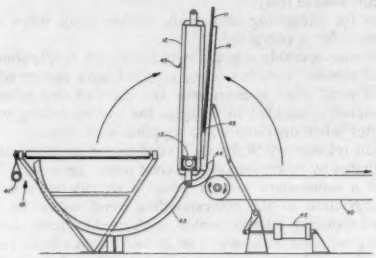
a set of live rolls arranged in parallel and in a single plane on which rests a thin flat body requiring inversion,

an inverter shaft extending at a right angle to the set of live rolls and spaced from one end of the live rolls,

a series of slider boxes spaced along the shaft opposite selected spaces between the live rolls and keyed to the shaft at these positions to turn with the shaft,

a lifting arm extended through each slider box wherein each lifting arm includes two beams held in parallel by end pieces to engage its box through rollers mounted in the box and arranged to reciprocate end for end through its slider box as the boxes are rotated with the shaft,

a series of cams extending and arranged beneath the live rolls and inverter shaft with the arrangement for each cam to alternately receive the ends of the lifting arms as the



inverter shaft rotates and guide and control its arm in its reciprocation through the slider box with the result that the lifting arms pivot at the inverter shaft to elevate the thin flat body from the live rolls and transfer it to a station laterally adjacent the live rolls,

and a set of receiving arms positioned to receive the thin flat body and lover it to the transfer station.

4,220,240
METHOD AND MACHINE FOR CONTINUOUSLY TRANSPORTING STARTING SHEETS

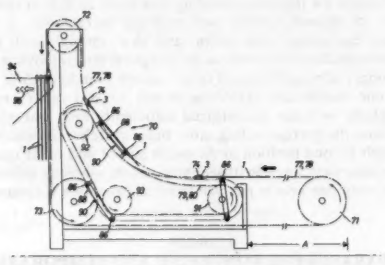
Gustav S. I. Norberg, and Kjell E. L. Segerström, both of Karlstad, Sweden, assignors to C. J. Wennberg AB, Karlstad, Sweden

Filed Sep. 28, 1977, Ser. No. 837,356

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644632

Int. Cl.² B65G *17/32, 47/24*

U.S. Cl. 198—408 **7 Claims**



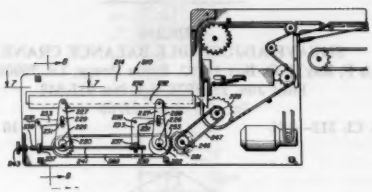
1. A method for continuously transferring and transporting starting sheets for the electrolytic refining of metals, particularly copper, from a horizontal position into a vertical position for introduction into a stand in which the starting sheets are stored for subsequent suspension at equal intervals in the electrolytic refining baths, comprising the steps of: taking the starting sheets by their cathode bars and advancing them substantially horizontally and then continuously advancing said sheets without an interruption of movement at a substantially constant speed.

4,220,241

AUTOMATIC BREAD FEEDER

William G. DeGray, P.O. Box 36, Port Isabel, Tex. 78578

Filed Nov. 8, 1978, Ser. No. 958,785
Int. Cl.[2] B65G *15/00*
U.S. Cl. 198—408 13 Claims



12. A conveyor for intermittently advancing a row of items in one direction along a predetermined path, an abutment supported in items blocking position along said path, facing in the opposite direction and shiftable for and back along said path, drive means driving said conveyor in timed relation to advance said abutment in said opposite direction in slightly delayed time relation to operation of said conveyor to advance said items in said one direction, and items engaging and lateral shifting means driven by said drive means in timed sequence with said conveyor and abutment to engage and laterally displace the item adjacent said abutment from said path subsequent to initial shifting of said abutment in said one direction along said path.

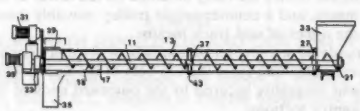
13. In a walking beam conveyor, a pair of upstanding generally parallel arms, the lower ends of said arms being journaled on eccentrics rotated about generally horizontal axes transverse to said arms, a conveyor beam, the opposite end portions of said conveyor beam being pivotally supported from the upper ends of said arms for relative angular displacement of said arms relative to said beam about axes transversed to said arms and beam, each of said arms including an elongated longitudinally extending guide structure and a pair of pivot structures supported for vertical adjustment in unison, relative to said axes and slidably engaged in said guide structure.

4,220,242

SCREW CONVEYOR WITH INTERMEDIATE BEARING

Georg L. K. Forsberg, Nylandsgatan 14, Karlstad, Sweden

Filed Nov. 14, 1978, Ser. No. 960,721
Claims priority, application Sweden, Nov. 21, 1977, 7713075
Int. Cl.[2] B65G *33/20, 33/32*
U.S. Cl. 198—666 8 Claims



1. A screw conveyor for feeding solid granular material, comprising:

a rotary shaft with a screw blade attached thereto;

a drum surrounding said screw blade and substantially concentric therewith said drum being rotatable about an axis concentric with said shaft axis;

means for simultaneously rotating said shaft and said drum in opposite directions;

bearing means for supporting said shaft for rotation with respect to said drum at an intermediate axial position of said shaft, said screw blade being discontinued at said bearing means and having two end portions spaced apart a distance greater than the axial length of said bearing means along said shaft; and

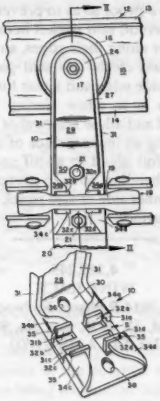
means for connecting said bearing means to said drum to stationarily attach said bearing means to drum so that the bearing means rotate with said drum and relative to said rotary shaft, and for applying an axial force to the material being fed past the discontinuity in said screw blade upon relative rotation between said screw blade and said drum.

4,220,243

CHAIN BRACKET WITH STRENGTHENED CHAIN SUPPORTS

Charles C. Frost, Ada, and Siegfried K. Weis, Byron Center, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Jan. 25, 1978, Ser. No. 872,244
Int. Cl.[3] B65G *17/20, 17/38*
U.S. Cl. 198—687 37 Claims

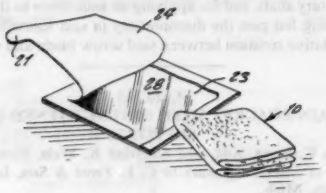


1. In a trolley bracket adapted for use with overhead conveyors, the trolley bracket being elongated and including a first end portion having means for supporting a trolley wheel thereon, a second end portion having a chain support for supporting the link of a conveyor chain for moving said bracket along a support when a trolley wheel is attached, and a connecting portion connecting said first and second end portions, said second end portion including means for securing said bracket to a bracket attachment or another of said brackets, the improvement comprising:

said trolley bracket being stamped in one piece from sheet metal; said chain support including chain pad means having portions for supporting at least two spaced portions of a chain link when such a chain link is mounted thereon, said portions of said chain pad means being spaced transverse to the direction of elongation of said bracket, said chain pad means being bent from said bracket sheet metal, having at least one chain link engaging surface thereon, and having a thickness less than the length measured transverse to said elongation of said bracket; reinforcing means formed in one piece with and bent from said bracket sheet metal and extending at an angle to said chain pad means such that said reinforcing means extend generally in a plane other than parallel to said chain pad means and support said chain pad opposite to said link engaging

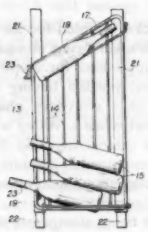
surface of said chain pad means for resisting bending of said chain pad means when under load.

4,220,244
FRESH FACE PAD
Sabra Elmore, 98 Riverside Dr., New York, N.Y. 10024
Filed Jun. 9, 1978, Ser. No. 914,067
Int. Cl.[2] B65D *81/22, 81/36;* **A45C** *11/00*
U.S. Cl. 206—210 **1 Claim**



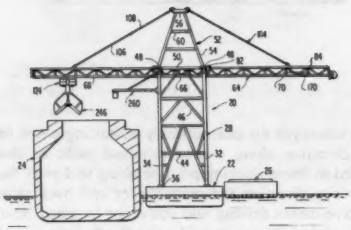
1. A fresh face pad, comprising, in combination, a face cloth and a packet that encloses said face cloth, said face cloth being made of a soft cloth that is saturated with salt water, said packet being moisture-proof so as to prevent drying out of said cloth prior to use thereof; said packet being comprised of two panels glued together along their edges, so as to form a central pocket containing said cloth, one said panel including a tab projecting along its side edge and a tear line aligned with each edge of said tab, so as to allow tearing out a large central opening of said panel and allow removal of said cloth from said pocket while exposing an inner surface of the other said panel, comprising a metal foil glued to a stiff cardboard having the characteristic of not bending, so as to prevent bending said foil, said foil forming an inner side of said panel, and said foil having a reflective mirror surface.

4,220,245
WINE RACK
Patrick G. Corcoran, 3014 Rollison, Redwood City, Calif. 94063
Filed Jul. 31, 1978, Ser. No. 929,433
Int. Cl.[2] A47B *73/00*
U.S. Cl. 211—49 R **5 Claims**



1. A wine rack comprising:
a frame having a plurality of vertical compartments entirely open along the front, each compartment adapted to hold substantially horizontally disposed and vertically stacked wine bottles with their cork ends facing the front, the frame additionally having a horizontal restraining bar extending across the open front of the frame, slightly above the bottom thereof, for restraining and tilting the lowermost bottles in each stack so as to tilt each stack and thereby prevent any of the bottles in a stack from sliding out of the rack and wherein each compartment has a depth sufficient to fully enclose standard wine bottles, such that when the bottles are flat their cork ends will abut the horizontal restraining bar, the depth also being such that the necks of longer wine bottles will protrude outside of the wine rack, whereby the bottommost of both the standard and longer bottles optionally can be pulled out slightly and tilted within each stack, to thereby tilt all of the bottles in the stack and also to restrain them from sliding out of the rack or optionally the bottommost bottle may be fully inserted within each stack whereby all the bottles in the stack will be horizontally disposed.

4,220,246
SHEAVE ADJUSTABLE BALANCE CRANE
Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 70808
Filed Jun. 15, 1978, Ser. No. 915,848
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—191 **10 Claims**



1. An adjustable balance crane comprising:
a platform having an upper deck;
a tower assembly comprising first and second upright column assemblies extending vertically from the platform above the deck in laterally spaced apart relationship to one another;
the tower assembly further comprising an upper structure spanning and fixed to the column assemblies, said upper structure including top bars, and including a fixed central gantry section which extends between the column assemblies;
the fixed central gantry section having opposite end portions which extend outwardly of the column assembly;
an operator's cab assembly, including a cab and a mounting arm, the mounting arm being horizontally pivotally connected to the first upright column assembly for lateral pivotal movement with respect thereto, and the cab being movable inwardly and outwardly along the mounting arm;
first and second outer gantry sections, each including an inboard end and an outboard end, the inboard ends being vertically upwardly pivotally connected to the respective end portions of said fixed central gantry section;
the gantry sections each having at least two vertically disposed longitudinally extending track means thereon, the respective track means of the sections being horizontally aligned;
a bucket trolley movably mounted on the lower of said track means, and a counterweight trolley movably mounted on the upper of said track means;
articulated support tension members pivotally connected to and extending from the top bars of the upper structure to and hingeably secured to the outboard ends of the outer gantry sections;
cable means for pivotally moving the outer gantry sections from horizontal operating positions aligned with the fixed central gantry section to generally upward vertical transport positions; and
a cable and sheave system for simultaneously adjusting the relative positions of said bucket trolley and said counterweight trolley on said vertically disposed track means in opposite directions.

4,220,247

CLOSURE MEMBERS

Steven G. Kramer, 60 El Verano Way, San Francisco, Calif. 94127

Continuation-in-part of Ser. No. 344, Jan. 2, 1979, abandoned. This application Apr. 4, 1979, Ser. No. 26,839

Int. Cl.[3] B65D *55/02*

U.S. Cl. 215—219 15 Claims

1. A closure for a container, said closure comprising

a. an outer housing having

(1) an open bottom, and

(2) an aperture extending through a portion thereof,

b. an inner housing adapted to be mounted on such a container,

c. said inner housing

(2) being mounted in said outer housing in nested relation thereto,

(2) having

(a) an open bottom,

(b) a plurality of types of indicia disposed thereon, and

(3) being rotatable, relative to said outer housing, around the center axis of said last mentioned open bottom in a direction effective to pass said indicia past said aperture for viewing said indicia through said aperture from outside said outer housing,

d. a plurality of abutment members mounted on said inner housing, between said last mentioned open bottom and the top of said inner housing, and

e. another abutment member mounted in said outer housing in position to engage each of said first mentioned abutment members during said rotation of said inner housing in a manner effective to

(1) stop rotation of said inner and outer housings relative to each other in one direction around said axis, when said other abutment member is so engaged with one of said first mentioned abutment members, and

(2) yieldingly resist rotation of said inner and outer housings relative to each other in the direction opposite to said one direction around said axis, when said other abutment member is so engaged with one of said first mentioned abutment members,

f. said types of said indicia being so disposed on said inner housing that indicia of a respective one of said types is visible through said aperture when said other abutment member is disposed between a respective adjacent pair of said first mentioned abutment members.

4,220,248

CLOSURE WITH HINGED LID AND CAM AND SPRING ELEMENTS HOLDING LID OPEN OR CLOSED

Woodrow S. Wilson, Johnston, and Robert E. Hazard, Kingstown, both of R.I., assignors to Polytop Corporation, Slatersville, R.I.

Filed Oct. 31, 1978, Ser. No. 956,435

Int. Cl.[3] B67D *3/00*

U.S. Cl. 215—235 10 Claims

1. In a combination of a closure member having an opening leading therethrough and a lid member attached to said closure member by a hinge means so as to be capable of being located in a closed position in which said lid member covers said opening and so as to be capable of being moved away from said closed position so as to expose said opening the improvement which comprises:

said closure member having a cylindrical peripheral skirt shaped so as to include a flattened external area corresponding to the chord of a circle in the exterior of said skirt of said closure member adjacent to the top edge thereof, the projected curvature of said skirt of said closure member extending adjacent to said chord,

said closure member having a top which is covered by said lid member when said lid member is in said closed position, and including an annular peripheral shoulder,

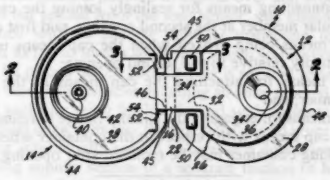
said lid member having a top and a dependent skirt having a flattened edge corresponding to and adjacent to the top edge of said flattened area of said skirt, which skirt of said lid member fits against said peripheral shoulder when said lid member is in said closed position,

two separate cooperating means for making the position of said lid member relative to said closure member unstable as said lid member is moved toward and away from said closed position,

one of said cooperating means being located on said skirt of said lid member adjacent said flattened area and appearing as a continuation of said skirt, the other of said cooperating means being located on said top of said closure member,

one of said cooperating means comprising a spring means and the other of said cooperating means comprising a cam means,

said closure and lid members, said hinge means, said spring



means and said cam means being integral with one another and being constructed of a polymer composition, the flexibility and deformability of which varies in accordance with the thickness of the polymer composition,

said spring means being located on one of said members so as to extend generally toward and parallel to the other of said members when said lid member is in said closed position,

said cam means being located on the other of said members in a position to deflect said spring means as said lid member is moved into and out of said closed position,

said spring means and said cam means are located interiorly of the exterior of said lid means and said skirt on said closure means when said lid member is in said closed position and being located generally between said lid member and said closure member when said lid is in said closed position,

said cam means being shaped so as to be positioned adjacent to said spring means when said lid member is in said closed position and so as to abut said spring means without deflecting said spring means in holding said lid member away from said closed position,

said cam means and said spring means being shaped so as to tend to make the position of said lid member relative to said closure member unstable as said lid member is moved toward and away from said closed position,

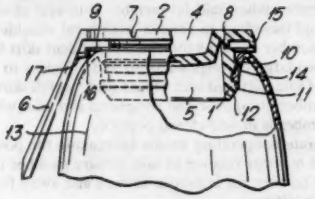
said hinge means extending along a part of the top edge of said flattened area of said skirt of said closure member and not projecting beyond the projected curvature of said skirt of said closure member extending adjacent to said chord, when said lid member is in said closed position.

4,220,249

CLOSING ARRANGEMENT FOR PACKING CONTAINERS

Erling I. Nilsson, Akarp, Sweden, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

Filed Jun. 20, 1978, Ser. No. 917,202
Claims priority, application Sweden, Jun. 20, 1977, 7707099
Int. Cl.[2] B65D *43/16, 43/18, 45/00*
U.S. Cl. 215—237 9 Claims



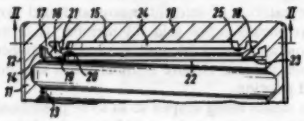
1. A packing container having a closure, comprising:
a container having a first opening;
an annular member securely received within the first opening to define a second opening, said annular member having a flange attached to an upper surface of the annular member, said flange extending outwardly from the container;
cap means for closing the second opening;
pull means for permitting the cap means to be manually moved relative to the second opening;
first connecting means for sealingly joining the cap to the annular member at the second opening, said first connecting means being broken when the cap means is moved manually relative to the second opening;
hinge means for attaching the cap means to the annular member; and
catch means for engaging the annular flange to releasably fix the cap means with respect to the container whereby the packing container may be reclosed after opening.

4,220,250

CLOSURE FOR CONTAINERS

Thomas D. Brownbill, West Bromwich, United Kingdom, assignor to Metal Closures Group Limited, West Bromwich, England

Continuation of Ser. No. 882,200, Feb. 28, 1978, abandoned. This application Apr. 5, 1979, Ser. No. 27,593
Claims priority, application United Kingdom, Dec. 5, 1977, 50545/77
Int. Cl.[2] B65D *53/00*
U.S. Cl. 215—270 5 Claims



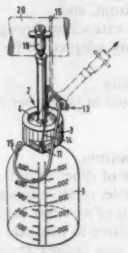
1. A closure for a container the contents of which are to be pressurized characterized by having a crown and a depending skirt, retaining means associated with said skirt adapted to cooperate with a neck of the container to which the closure is to be applied, a flexible annular sealing ring extending from an internal surface of the closure adapted to engage in sealing relationship with a container neck and a continuous support ring depending from the crown of the closure and disposed substantially concentrically within the sealing ring and dimensioned to limit the flexing of the sealing ring relative to the axis of the closure whereby the pressure of the contents of the container permeates between the support and the sealing rings to urge the ring into sealing engagement with the neck of the container to which the closure is applied, said skirt being further characterized by having an inwardly projecting annular bead disposed about the internal surface of the skirt at the level of the extremity of the sealing ring and adapted when the closure is applied to a container neck to abut the surface of the neck to center the closure on the container neck as the sealing ring and container neck are brought into sealing engagement.

4,220,251

CLOSURE FOR VACUUM BOTTLES AND THE LIKE

Hermann Hauri, Lenzburg, Switzerland, assignor to Genossenschaft Vebo Solothurnische Eingliederungsstätte Für Behinderte, Oensingen, Aarmatt, Zuckwil, Switzerland

Continuation-in-part of Ser. No. 799,946, May 24, 1977, Pat. No. 4,161,257. This application May 15, 1979, Ser. No. 39,302
Claims priority, application Switzerland, May 25, 1976, 6758/76
Int. Cl.[3] B65D *51/00*
U.S. Cl. 215—365 9 Claims



1. The combination of a container including a neck portion having an open end with a detachable closure comprising a substantially cylindrical portion surrounding said neck portion and having a first and a second end, and an end wall integral with said first end and extending across said open end, said end wall being deformable in response to establishment of a pressure differential between the interior and exterior of said container and having an outer side including means for indicating the extent of said pressure differential, said indicating means including at least one projection having a plurality of discrete sections and a plurality of surfaces provided on said sections, said surfaces being parallel to each other when said pressure differential equals a given value, and inclined with respect to each other when said pressure differential deviates from said given value.

4,220,252

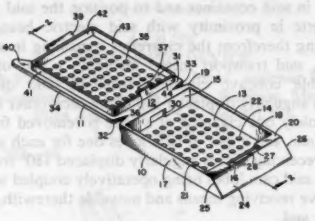
BIOLOGICAL SPECIMEN PROCESS APPARATUS

Glenn L. Beall, Gurnee, and Robert P. Noonan, Naperville, both of Ill., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 27, 1979, Ser. No. 70,265
Int. Cl.[3] B65D *39/00*
U.S. Cl. 220—307 8 Claims

1. A unitary biological specimen processing apparatus comprising an open-topped perforated receptacle member, a cooperable perforated cover member attached to said receptacle member by a frangible hinge portion, said receptacle and cover members being capable of relative movement about said hinge portion from a first position permitting placement of a specimen in said receptacle member to a second position wherein the open top of said receptacle member is closed by said cover member, and cooperable detent and abutment means on said

receptacle and cover members interengageable when said receptacle and cover members are in said second position to



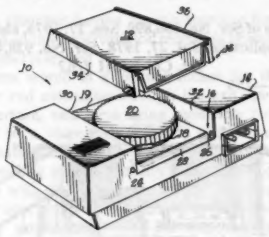
hold said members in said second position independently of said frangible hinge portion.

4,220,253

HINGE STRUCTURE

Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.

Filed Oct. 27, 1978, Ser. No. 955,393
Int. Cl.[2] B65D *43/16*
U.S. Cl. 220—338 **4 Claims**



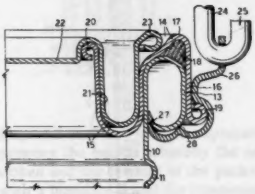
1. In combination, a base member, a cover member and hinge structure for hingedly joining said base and cover members, wherein said base member includes upright generally parallel wall surface portions, with each said portion having a knuckle bore formed therein, and said cover member includes at least a pair of side wall portions and an end wall extending between said side wall portions, a rod-like pin member carried by each said side wall portions on a lower segment thereof, said pin members extending oppositely and generally transverse to the outer surface of the associated wall portion, and said rod-like pin members being sized for rotatable disposition in said knuckle bores, said side wall portions of the cover in the pre-assembled state being flared outwardly with the overall dimension from the end of one rod-like member to the other being greater than the distance between said upright wall surface portions of the base member, and said end wall including a slot formed therin generally adjacent the respective confluences of said end wall and said side wall portions, each said slot extending from a location below the upper edge of the end wall and opening through the lower edge of said end wall, thereby enabling said side walls to flex in a resilient manner, such that upon assembly, said end walls may be flexed inwardly to permit said rod-like pin members to be disposed between said upright wall surfaces of the base member and engaged in said knuckle bores, with the resilient nature of said side walls maintaining said engagment while permitting said cover member to pivot relative to said bore member.

4,220,254

CONTAINER

Clifton G. Morton, 4 Stella St., Holland Park, Queensland, Australia (4121)

Filed Nov. 24, 1978, Ser. No. 963,610
Claims priority, application Australia, Nov. 25, 1977, PD2561
Int. Cl.[2] B65D *43/06, 25/00, 25/32*
U.S. Cl. 220—354 **5 Claims**



1. A container assembly comprising

(a) a substantially frusto-conical body having sidewalls, a closed bottom and a hollow bead formed at the top of said sidewalls, the outer face of said bead being spaced substantially from the plane of said sidewalls, the frusto-conical shape of said body permitting interfitting of a plurality of bodies for stacking and storage purposes.

(b) a separate top ring adapted to be shipped separately from said body and applied thereto after the container has been filled, said top ring being formed with an outer annular inverted channel adapted to extend over and around said bead but spaced from the top thereof, said channel being formed with an annular shoulder projecting upwardly from its top to form a space into which sealing compound can be placed before said top ring is secured to said body and bead, said shoulder including an inner tapered surface, and said ring being further formed with an inner annular channel open at its top, the sidewalls of said inner channel being substantially spaced to receive a downwardly projecting annular section of a separate friction-fit lid, and,

(c) a separate friction-fit lid having an annular downwardly turned peripheral channel adapted to extend into and be frictionally retained by said inner channel of said top ring and a bead extending laterally outwardly at the top thereof and adapted to engage said inner tapered surface of said shoulder of said outer inverted channel when said lid is fully closed, said shoulder providing a fulcrum for a lever for removing said lid, said lid thus being adapted to be either shipped and/or stored separately from said top ring or frictionally engage therewith for mounting the same to said body and hollow bead after the container body has been filled.

4,220,255

INSULATED TANKS FOR LIQUEFIED GASES

Arne Tonnessen, Moss, Norway, assignor to Moss Rosenberg Verft a.s., Moss, Norway

Continuation of Ser. No. 804,257, Jun. 7, 1977, Pat. No. 4,141,465. This application Oct. 4, 1978, Ser. No. 948,402
Claims priority, application Norway, Aug. 23, 1976, 762893
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[3] F17C *3/06*
U.S. Cl. 220—445 **7 Claims**

1. A generally cylindrical heat brake construction for supporting a spherical storage tank for liquefied gas, comprising, a top skirt the temperature of which may vary between the temperature of liquefied gas in the tank and the ambient temperature of the surrounding atmosphere, a bottom skirt which is normally at said ambient temperature, and an intermediate skirt which is integral with said top skirt at its top edge and integral with said bottom skirt at its bottom edge, said intermediate skirt having a coefficient of thermal expansion which is

between the respective coefficients of thermal expansion of said top skirt and said bottom skirt, and layers of insulation covering the skirt surfaces between said atmosphere and said intermediate and top skirts whereby said top skirt may be cooled to a temperature approaching that of liquefied gas while said bottom skirt remains at said ambient temperature

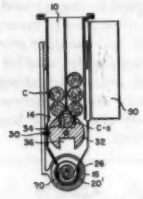
and said intermediate skirt provides the heat brake between said top and bottom skirts, the characteristics of said intermediate skirt being such that it changes from a cylindrical configuration toward a substantially frusto-conical configuration when the temperature of its top edge changes from said ambient temperature to the temperature of liquefied gas.

4,220,256

AUTOMATIC DISPENSER FOR AUTOMATICALLY DISPENSING LIGHTED CIGARETTES

Aldo Torri, via Catalani 34, Livorno, Italy

Filed Oct. 16, 1978, Ser. No. 951,985
Int. Cl.³ A24F *15/10*
U.S. Cl. 221—147 **10 Claims**



1. An automatic dispenser for automatically dispensing lighted cigarettes, comprising in combination:

a container adapted to hold and store one or more unlit cigarettes, said container having a mouth portion from which a cigarette can be dispensed;

cigarette lighting means operatively associated with said container for receiving a cigarette therefrom and including an electric heater for lighting the head of a cigarette;

cradle means associated with said container and said cigarette lighting means adapted to receive a cigarette from said container and position said last-mentioned cigarette into juxtaposition with said cigarette lighting means, said cradle means including a cigerette withdrawal means to permit withdrawal of a cigarette from said cradle means;

transport means associated with said container and said cradle means having two operable positions, operable in one of said positions to receive a cigarette for transport thereof to said cradle means and in the other of said positions to isolate the said received cigarette from the cigarettes in said container and to position the said received cigarette in proximity with said electric heater while isolating therefrom the cigarettes remaining in said container, said transport means including a pair of spaced rotatable concave cigarette receiving and dispensing means angularly displaced 180° from each other to insure that solely one cigarette at a time is removed from said container, and a pair of cam lobes one for each said concave receiving means angularly displaced 180° from each other, said cam lobes being operatively coupled with said concave receiving means and movable therewith, respectively; and,

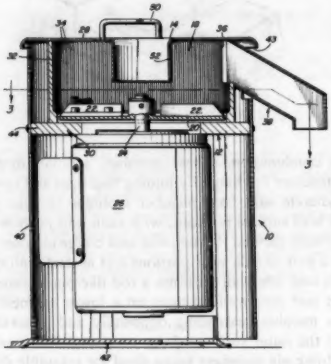
switch means external of and associated with said transport means and said cigarette lighting means for energization thereof by coupling said heater to a source of energy when said transport means transports a cigarette from said container to said cradle means, said switch means including an activation switch operatively associated with said cam lobes for connection of said heater to the source of energy for energizing said heater for a time period sufficient to light a cigarette, said cam lobes aligned with said cigarette receiving and dispensing means to activate said activation switch upon deposit of a cigarette in said cradle means by said transport means.

4,220,257

SPRING SEPARATOR

John E. Hazelwood, Sr.,, 2537 Cicero Rd., Noblesville, Ind. 46060

Continuation of Ser. No. 506,899, Sep. 17, 1974, abandoned. This application Jul. 27, 1978, Ser. No. 928,449
Int. Cl.² B65H *3/62*
U.S. Cl. 221—156 **22 Claims**



1. A parts separator for separating coiled springs and spring-like parts, comprising, in combination:

(a) a housing provided with an inlet opening for feeding tangled parts into the housing;

(b) a striker means arranged in the housing for imparting energy to the parts;

(c) traction means comprising protuberances on the inner surface of the housing for promoting a spinning action of parts energized by the striker means;

(d) the striker means including a disc rotatably mounted and arranged for substantially covering an associated wall of the housing, and at least one blade mounted on the disc for rotation therewith; and

(e) the housing having a pair of opposed walls, with the inlet opening being provided in the first opposed wall and the disc being arranged adjacent to and covering the second

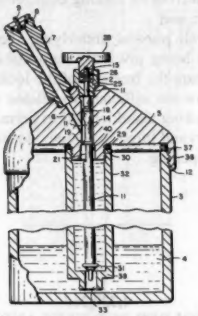
opposed wall for preventing parts from being jammed between the blade and the housing, the blade extending into the housing toward the first opposed wall and toward the opening provided therein.

4,220,258

DISPENSING DEVICE

Frederick P. Gruenewald, Boston, Mass., assignor to Gruenewald Manufacturing Company, Inc., Waltham, Mass.

Filed Aug. 4, 1978, Ser. No. 931,176
Int. Cl.[2] B67D 5/22
U.S. Cl. 222—46 **14 Claims**



1. A dispensing device for delivering fluids under pressure comprising:

a metering chamber having an exit aperture for dispensing fluids and an inlet aperture for receiving pressurized fluids from a reservoir; and

a valve stem seated in a closure means for the metering chamber and extending through the exit aperture to the inlet aperture, said stem being moveable from a closed position to a dispensing position and including a first means sealing the exit aperture in a closed position and a second sealing means normally disposed to open the inlet aperture with the stem in the closed position and to seal the inlet aperture with the stem in the dispensing position, whereby pressurized fluids fill the metering chamber while the stem is in the closed position and a quantity of fluid metered by the chamber is delivered from the chamber with the stem in the dispensing position;

said metering chamber further including said closure means being moveably attached to the chamber for external adjustment of the stem from the outside of the device to an alternative position in which the second sealing means is disposed to open the exit aperture with the stem in the dispensing position so as to allow an unmetered delivery of fluid and the movement of said closure means to said alternative position being such that the passage of pressurized fluid to the metering chamber is uninterrupted by said external adjustment of the stem.

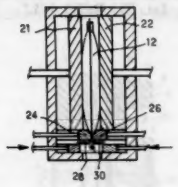
4,220,259

PROCESS AND APPARATUS FOR AT SITE PREPARATION OF BEVERAGES

Jean Lagneaux, Bourg-Argental, France, assignor to Societe Generale Pour L'Emballage, Paris, France

Filed Dec. 29, 1978, Ser. No. 974,554
Claims priority, application France, Dec. 30, 1977, 77 39838
Int. Cl.[3] B67B 7/28
U.S. Cl. 222—82 **11 Claims**

1. A process for preparing beverages for at site consumption which comprises, positioning an ingredient containing packet in a discharge mechanism, said packet being compressible and configurated with a boundary seal and a contents discharge passage therein, the contents discharge passage having a pressure rupturable seal intermediate the contents and the boundary seal, securing the packet in the discharge mechanism, severing the packet at the contents discharge passage intermediate the boundary seal and the pressure rupturable seal, and thereafter compressing the packet whereby the pressure rupturable seal is broken and the content of the packet is released to a container with a blending liquid for consumption.

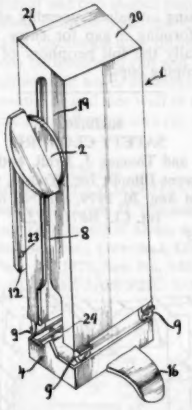


4,220,260

TUBE CADDY AND DISPENSER FOR COLLAPSIBLE TUBES

Loresta M. Webster, Rte. 2, Box 260W, Conroe, Tex. 77302

Filed Apr. 19, 1977, Ser. No. 754,820
Int. Cl.[2] B65D 35/28
U.S. Cl. 222—100 **1 Claim**



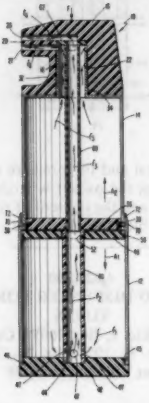
1. A rectangular casing having top, rear, front and side walls and open at the bottom to receive a collapsible tube; said side walls having elongated vertical slots; a grooved shaft key adapted to extend through both of said elongated slots to received the butt end of a tube placed therein; knobs located on the ends of the shaft key for placement outside of the side walls of the casing when the shaft key is placed through the elongated slots; a plurality of pegs located on the bottom of the casing, said pegs each having an outwardly extending horizontal shoulder; a bottom unit having a flexible pronged opening formed in the bottom thereof for receiving the neck of a tube placed there through; said bottom unit further having a closure cap hinged thereto for pivotal movement between a sealing position and a non-sealing position, said closure cap further including a pressure plate and a spring located between said cap and said plate for biasing said plate in sealing contact against the opening in the neck of the tube when said cap is in said sealing position; and said bottom unit further including walls corresponding to the front and rear walls with each wall having a horizontal groove located on the inside thereof to cooperate with said shoulders on said pegs for retaining said bottom unit on said casing.

4,220,261

DISPENSING CONTAINER ASSEMBLY

Douglas J. White, 173 Hillside Ave., Nutley, N.J. 07110

Continuation-in-part of Ser. No. 667,331, Mar. 16, 1976. This application Apr. 19, 1978, Ser. No. 899,105
Int. Cl.[2] B67D 5/52
U.S. Cl. 222—135 20 Claims



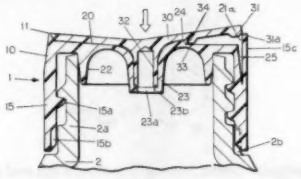
6. The dispensing container assembly of claim 1, wherein said means for forming a gap for entry of air is provided around substantially the full periphery of said interface between said telescoping cups.

4,220,262

SAFETY CLOSURE

Albert R. Uhlig, and Thomas J. Krall, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 20, 1979, Ser. No. 68,037
Int. Cl.[2] B67D 5/32
U.S. Cl. 222—153 4 Claims



1. A safety closure for a container neck comprising, in combination,

(1) an inverted cup-shaped body member molded from a resilient plastic and having a circular top panel portion and an integral depending annular sidewall;

(2) means on said annular sidewall for securing the closure to a container neck;

(3) a locking flap connected by an integral hinge to a peripheral portion of said top panel portion;

(4) said top panel portion defining a recess corresponding in configuration and depth to said locking flap, whereby said locking flap may be folded about said integral hinge to lie in said recess with no edge portion of the locking flap projecting out of said recess and with the free end of the locking flap overlying a portion of said sidewall and abutting the radial end wall of said recess;

(5) means in the base of said recess defining a locking shoulder located on the side of the said dispensing opening remote from said hinge;

(6) a first depending protuberance on said locking flap defining a hook portion resiliently engageable with said locking shoulder to lock said locking flap within said recess;

(7) means in said recess defining a dispensing opening for the container contents;

(8) said locking flap having a second depending protuberance sealingly engaging said dispensing opening when said locking flap is folded into said recess, a portion of said protuberance having a solid engagement with the wall of said dispensing opening, whereby the application of a downward force to the portion of the locking flap over said second protuberance will displace the free end of the locking flap in an upward direction without releasing said hook portion from its locking engagement with said locking shoulder; and

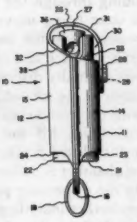
(9) said sidewall portion underlying the free end of said locking flap being inwardly deformable by finger compression to cam the free end of the locking flap upwardly out of said recess sufficient to release said hook portion from said locking shoulder and to permit it to be engaged by the fingers and lifted to an open position relative to said dispensing opening.

4,220,263

COMBINED HOLDER FOR KEYS AND PROTECTIVE SPRAY

Albert P. Caruso, 147 Broadmoor Dr., Tonawanda, N.Y. 14150

Continuation of Ser. No. 608,929, Aug. 29, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 840,734
Int. Cl.[3] B65D 83/14
U.S. Cl. 222—183 9 Claims

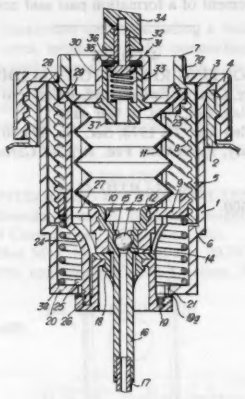


1. A combined holder for keys and a protective spray container for carrying in a pocket or purse comprising a casing including a body portion for receiving a protective spray container containing an actuating button and a nozzle for dispensing a spray for warding off an attacker, retaining means for retaining said container within said body portion, and key-supporting means attached to said casing, said body portion being tubular and including first and second opposite ends, said retaining means comprising a flap located at said first end, said container being oriented in said body portion with said actuating button and said nozzle proximate said first end, said key-supporting means being located at said second end, said casing including a front panel and a rear panel stitched to said front panel, said flap comprising an extension of said rear panel, first fastener means on said flap, second fastener means on said front panel for coacting with said first fastener means to maintain said flap in a closed position, said flap being movable to permit said actuating button of said container to be digitally actuated by pressing on said flap, and an open space between said flap and said body portion to permit a spray to emanate from said nozzle and project beyond said casing while said flap is closed.

4,220,264
PUMP DISPENSERS

Rustom K. Gamadia, London, England, assignor to Lever Brothers Co., New York, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,116
Claims priority, application United Kingdom, Sep. 27, 1977, 40093/77
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—207 7 Claims



1. A hand operated pump dispenser comprising a housing adapted for fitment to a fluid container with the housing extending into the fluid containing container space, a discharge reservoir in the form of a bellows having a discharge end and an inlet end, the discharge end being in a fixed position relative to the housing, a first actuating member having a portion extending outwardly through the top of the housing and movable within the housing to expand the bellows by moving the inlet end of the bellows relative to the housing, the inlet end of the bellows having inlet means including a one way valve for the ingress of fluid into the bellows and a tubular extension extending through the housing and in sealing engagement therewith, spring means energised by movement of the first actuating means to expand the bellows and effective to pressurise fluid contained in the bellows, and second actuating means including a finger operated discharge valve at the discharge end of the bellows for the discharge of fluid under pressure from bellows.

4,220,265
PRESSURE FILLABLE DISPENSING DEVICE

Joseph J. Shay, Manchester, N.H., assignor to Ethyl Corporation, Richmond, Va.

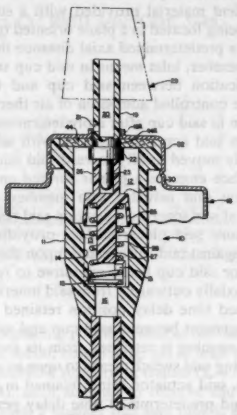
Filed Feb. 21, 1979, Ser. No. 13,090
Int. Cl.[3] B65D *83/00*
U.S. Cl. 222—402.2 16 Claims

1. A dispensing device for a pressurized liquid container capable of delivering metered quantities of an aerosol composition having a discharge tube through which the container can be filled with fluids under pressure comprising:

a. a generally cylindrical chamber including an upper chamber and a lower chamber, said generally cylindrical chamber being adapted to be sealed into a neck of said container, said upper chamber being closed at the upper end with respect to said container by seal means;

b. discharge tube means mounted in said seal means and extending therethrough into said generally cylindrical chamber, said discharge tube being resiliently biased toward the upper end of said upper chamber and being movable axially in said generally cylindrical chamber; and,

c. a cup-shaped piston member connected to said discharge tube with its open end towards the lower end of said lower chamber, said cup-shaped piston member having a laterally resilient rim with the entire periphery thereof sliding directly against the side wall of said lower chamber when said discharge tube is depressed a predetermined amount to isolate a metered quantity of fluid within said upper

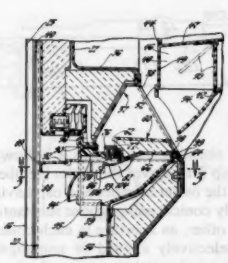


chamber, said rim of said cup-shaped piston member being sufficiently resilient to allow fluids introduced under pressure through said discharge tube during filling of said container to flow between said rim and said side wall of said lower chamber, said lower chamber having a plurality of nibs connected to said side wall of said lower chamber for mechanically deflecting said rim inwardly.

4,220,266
ICE DOOR DELAY MECHANISM

Ralph S. Braden, Bellbrook; Louis D. Benasutti, Fairborn, and Jerry L. Neubauer, Dayton, all of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Sep. 28, 1978, Ser. No. 946,504
Int. Cl.[2] E05F *5/06*; F25C *5/18*
U.S. Cl. 222—477 1 Claim



1. In an ice piece dispensing apparatus having means defining an opening, closure means normally gravity biased to block said opening against the passage of ice pieces therethrough, an actuator reciprocally operable along its axis of travel for moving said closure means from its biased closed position to an open position permitting ice pieces dispensed from said apparatus to enter said opening, sequentially related switch means and time delay means operated in response to the reciprocal movement of said actuator energizing said apparatus and delaying the closing of the opening by said closure member, respectively; the improvement wherein said switch means being

operated by an arm member on said actuator extending transversely relative to said actuator axis of travel, whereby upon said actuator being moved axially to its innermost position said arm member contacts said switch means energizing said apparatus causing ice pieces to be discharged gravitationally through said opening, said time delay means in the form of a suction cup structure positioned on said actuator having a body of resilient material provided with a suction face, said suction face being located in a plane oriented transverse to said actuator axis a predetermined axial distance inwardly relative to said arm member, inlet means in said cup structure providing communication between said cup and the atmosphere permitting the controlled admission of air thereto for destroying the suction in said cup after a predetermined time interval, whereby upon said actuator together with said arm member being manually moved axially toward said innermost position said suction face engages a planar surface on said apparatus such that upon said actuator arm member contacting said switch means at said innermost position said resilient cup being deformed against said planar surface providing a cushioned stop position against said surface and, upon the manual release of said actuator said cup being operative to resiliently return said actuator axially outwardly from said innermost position to a predetermined time delay position retained by the suction gripping engagement between said cup and said surface such that said arm member is retracted from its switch contacting position allowing said switch means to open so as to deenergize said apparatus, said actuator being retained in said time delay position for said predetermined time delay period to prevent the closing of said closure means to insure that all the dispensed ice pieces have passed through said opening, and whereby upon the completion of said time delay period sufficient air has entered said cup via said air inlet means to destroy the suction in said cup allowing said actuator to return to its biased outer position as a result of said closure member being returned to its closed position.

4,220,267

CLOSURE ASSEMBLIES

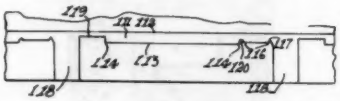
Peter Gegenhuber, Randburg, South Africa, assignor to Michael J. Harris, Bedfordview, South Africa

Filed Feb. 6, 1979, Ser. No. 10,044

Claims priority, application South Africa, Oct. 18, 1976, 76/6195; Feb. 9, 1978, 78/0778

Int. Cl.² B65D *35/48*

U.S. Cl. 222—520 **15 Claims**



1. A closure assembly comprising a hollow tubular outlet member and a cap fitting over the outlet member and rotatable relative thereto the outlet member and cap having complimentary, substantially conical end portions substantially in engagement with each other, an aperture in each conical end portion which can be selectively aligned or non-aligned by relative rotation of the cap and outlet member and wherein the cap has a tubular portion adjoining with the conical end portion and located over the hollow tubular outlet member so as to be co-axial therewith, one of such tubular portions having at least one formation directed towards the other tubular portion and co-operating with a cam surface on said other tubular portion wherein said cam surface is shaped such that the conical or truncated conical end portions are urged axially into tighter engagement with each other during at least a part of the allowed rotation of the cap in a direction away from that in which the apertures are aligned, the closure assembly being characterized in that the tubular portion having the cam surface therein is provided with one axially extending channel shaped to receive each formation carried by the other tubular portion such that each channel receives said formation when the cap is moved axially onto the outlet and wherein the cam surface communicates with each channel through a zone associated with the inner region of the channel such that after introduction of each formation fully into a channel formation to align with the cam surface, rotation of the cap relative to the outlet forces the formations into co-operation with the cam surface by way of said zone which is formed to act as a catch to inhibit movement of a formation past said zone.

4,220,268

SELF SUPPORTING REFRACTORY SLIDING PLATE

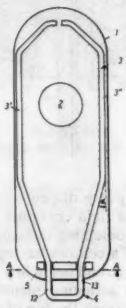
Hans R. Fehling, Geneva, Switzerland, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,401

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718701

Int. Cl.² B22D *41/08*

U.S. Cl. 222—600 **16 Claims**



1. A self-supporting sliding plate for sliding gate nozzle apparatus having at least one outlet opening and consisting predominantly of refractory concrete, metallic reinforcement at least part of which is embedded immovably in the concrete and at least one coupling member for operation of the sliding plate connected to the reinforcement.

4,220,269

SLIDE GATE NOZZLE FOR A CASTING VESSEL

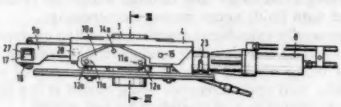
Karl D. Beckers, Neunkirchen-Seelscheid; Eckart Hees, Dinslaken, and Gerhard Bauer, Moers, all of Fed. Rep. of Germany, assignors to Martin & Pagenstecher GmbH, Cologne and Thyssen Aktiengesellschaft, vorm. August Thyssen-Hütte, Duisburg, both of, Fed. Rep. of Germany

Filed Aug. 16, 1978, Ser. No. 934,182

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1977, 2736817

Int. Cl.² B22P *41/08*

U.S. Cl. 222—600 **9 Claims**



1. A slide gate nozzle for a casting vessel having discharge opening comprising a bottom housing for receiving a head plate, a closure frame elastically supported against said casting vessel in juxtaposition to said bottom housing, said closure frame (9) including a slide gate housing for receiving a slide

plate and holding it pressed upwards against said head plate, and guide elements extending in a sliding direction relative to said head plate, said slide gate housing being slidable in said guide elements for pressing said slide plate against said head plate in a sliding direction thereof, the improvement comprising:

means pivotally connecting said slide gate housing with said closure frame,

said closure frame includes two spaced independent arms and

said pivotal connection means including a rocker frame for each said arms, means pivotally connecting said rocker frame to its said respective arm to form a pivot axis which extends transversely to the sliding direction, and roller guidance means connected with each said rocker frames to cooperate with said guide elements.

4,220,270

FLOW CONTROL DEVICE FOR MOLTEN METAL

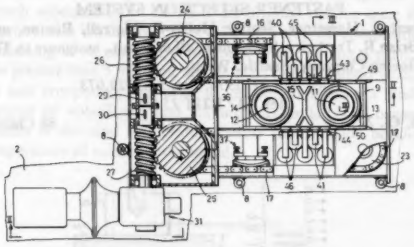
Stanislav Szadkowski, Brussels, Belgium, assignor to Vesuvius International Corporation, Wilmington, Del.

Filed Mar. 14, 1979, Ser. No. 20,397

Claims priority, application United Kingdom, Mar. 21, 1978, 11180/78

Int. Cl.[2] B22D *41/10*

U.S. Cl. 222—600 **10 Claims**



1. A slide gate device for use on a pour vessel to control the flow of molten metal through an outlet in the vessel shell, in which a refractory plate having an aperture is linearly movable in a plane which is perpendicular to the axis of the outlet in the vessel shell, whereby said aperture in said refractory plate may be brought in alignment with the outlet in the vessel shell, said device comprising;

at least one refractory plate supporting frame, each supporting frame being linearly movable in a plane perpendicular to the axis of the outlet in the vessel shell and bearing at least one refractory insert plate having at least one aperture, whereby said supporting frame is introduceable into and removable from the slide gate device from a side of the device without dismounting said device;

moving means for the refractory plate supporting frame arranged at both lateral sides of said supporting frame in the moving plane thereof, said moving means being interdependently coupled and adapted to transmit an equally distributed force to each lateral side of said refractory plate supporting frame;

a pushing system for urging said refractory plate supporting frame, in the vicinity of the outlet in the vessel shell, towards said outlet, said pushing system comprising levers acting on each side of the supporting frame, said outlet having a heat radiating area, and force supplying means removed from the heat radiating area of said outlet, acting on said levers;

whereby the refractory insert plates may be moved in very close cooperating contact with a perforated refractory outlet plate so as to control the flow of molten metal therethrough.

4,220,271

DEVICE FOR REPLACING POURING TUBES

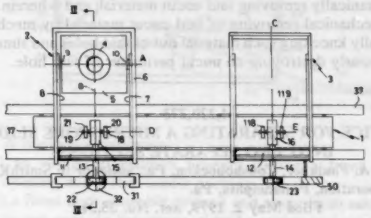
Stanislav Szadkowski, Brussels, Belgium, assignor to Vesuvius International Corporation, Wilmington, Del.

Filed Apr. 12, 1979, Ser. No. 29,403

Claims priority, application United Kingdom, Apr. 24, 1978, 16121/78

Int. Cl.[3] B67D *3/02*; C21C *5/46*

U.S. Cl. 222—607 **10 Claims**



1. Device for replacing pouring tubes at the outlet of a pour vessel for molten metal, comprising: (a) at least two mutually interconnected movable supporting frames (2,3) for refractory pouring tubes (4), each adapted to receive and support one pouring tube in such a manner that said tube is able to swivel around two perpendicular rotation axes (A; B or C) extending perpendicularly to the axis of the vessel outlet, (b) guiding means (36, 37, 24, 50) for leading said interconnected movable supporting frames in front of the vessel outlet (25) according to a linear path, substantially perpendicular to the axis of the vessel outlet, and (c) steering and pushing means (22, 27), acting on said supporting frames, to bring the upper surface of the pouring tube into close contact with a refractory plate (28) located at the vessel outlet and to urge said pouring tube tightly against said refractory plate, when the supporting frames are in the vicinity of the vessel outlet.

4,220,272

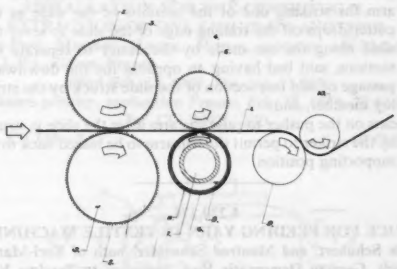
PRECISION CUTTING MEANS

Bernard R. Danti, 235 Bedford St., Lexington, Mass. 02173

Filed Oct. 30, 1978, Ser. No. 955,873

Int. Cl.[2] B26F *3/00*

U.S. Cl. 225—2 **3 Claims**



1. A process for placing a series of holes or predetermined shape and spacing into a thin web of material, said process comprising the steps of

(a) passing said web between two cutting edges, one above and one below said sheet and each substantially corresponding to the shape of the hole to be cut;

(b) cutting simultaneously into said web with cutting actions by said cutting edges from above and cutting action by said cutting edge from below said web;

(c) limiting said cutting actions so that they proceed only to a point where said cutting edges are proximate to the

center of the cross section of such web, but are separate one from other relatively easily by a removable portion of uncut material; and

(d) mechanically removing said material forming said shape of hole to be cut; wherein said material being cut is a non-elastomeric organic polymer, and said cutting action is carried out simultaneously by substantially-identically shaped cutting edges; wherein said cutting edges mounted for rotation above and below said web, respectively form means to advance said web toward an apparatus for mechanically removing said uncut material; and wherein said mechanical removing of said uncut material by mechanically knocking such material out of said holes and simultaneously destroying an uncut perimeter of said hole.

4,220,273

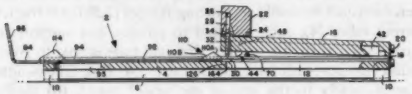
DEVICE FOR SEPARATING A MICROSCOPE SLIDE INTO TWO SEPARATE SECTIONS

Albert A. Faulkner, Conshohocken, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed May 2, 1979, Ser. No. 35,312

Int. Cl.³ C03B *33/02*

U.S. Cl. 225—96.5 **13 Claims**



4. A device for separating a microscope slide into two separate sections comprising:

a bed adapted to support a microscope slide,

an arm pivoted to the bed and overlying the bed,

a downwardly extending glass cutter mounted on the arm,

a spring biased trip lever mounted on the arm for supporting the arm with the cutter above the bed and spring biased into the supporting position,

a pusher for advancing a slide resting on the bed under the cutter,

means connected to the pusher for tripping the trip lever as the leading edge of the slide passes under the cutter to lower the cutter onto the slide to cut the slide along a line dividing the slide into two sections as it is advanced by the pusher,

a downwardly extending striking member mounted on the arm for striking one of the sections of the slide as the cutter drops off the trailing edge of the slide to sever the slide along the cut made by the cutter to separate the sections, said bed having an opening for the downward passage of said one section of the slide struck by the striking member, and

means on the pusher to raise the arm after the slide is struck by the striker to permit the trip arm to be biased back to its supporting position.

4,220,274

DEVICE FOR FEEDING YARN IN TEXTILE MACHINES

Frank Schubert, and Manfred Schneider, both of Karl-Marx-Stadt, German Democratic Rep., assignors to Textima Veb Wirkmaschinenbau, Karl-Marx-Stadt, German Democratic Rep.

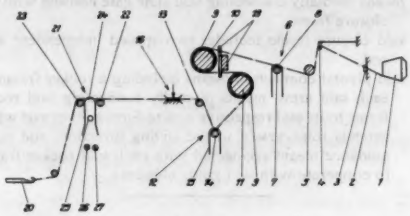
Filed May 31, 1979, Ser. No. 44,332

Claims priority, application German Democratic Rep., Jun. 2, 1978, 205747

Int. Cl.² B65H *51/30, 59/10*

U.S. Cl. 226—34 **10 Claims**

1. A device for feeding yarn in a textile machine, comprising at least one driving roller rotating at a circumferential speed exceeding the processing speed of the yarn in the machine; means for guiding said yarn around a circumferential portion of the driving roller; a first yarn brake arranged upstream of said roller; a first swing support arranged downstream of said roller and including a movable member in contact with said yarn to apply by its weight a tension on said yarn sufficient to bring the latter into a frictional engagement with the circumference of said driving roller, and a fixed stop member arranged for limiting the movement of said movable member to release said yarn from the tension applied by said movable member and thus to disengage the yarn from said frictional engagement with said driving roller; and a second yarn brake arranged downstream of said first swing support.



4,220,275

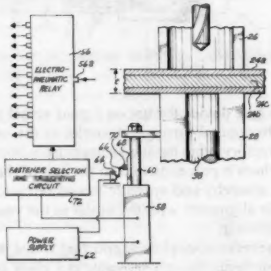
FASTENER SELECTION SYSTEM

Albert L. Hametner, Seattle; Hollis B. Merrell, Renton, and Brian R. Trethewy, Snohomish, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jul. 31, 1978, Ser. No. 929,073

Int. Cl.³ B21J *15/28*

U.S. Cl. 227—5 **38 Claims**



1. In a fastener selection and dispensing apparatus including means for dispensing a fastener of appropriate size for fastening workpieces together in response to a dispensing signal representing said appropriate size, the improvement comprising:

sensing means for sensing a composite thickness of said workpieces and generating an analog signal proportional to said composite thickness;

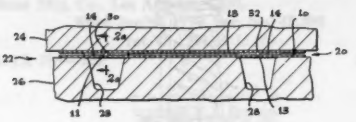
a selection circuit including an analog-to-digital converter circuit connected to said sensing means and a logic circuit connected to said converter circuit, said logic circuit including at least a first and a second output corresponding to a first fastener size and a second fastener size respectively, said converter circuit responsive to said analog signal for generating a digital signal which is a function of said analog signal, said logic circuit responsive to said digital signal for generating an output signal at only one of said first and second outputs determined as a function of said digital signal; and

a triggering circuit connected to said first and second outputs and responsive to said output signal for generating said dispensing signal.

4,220,276
METHOD FOR FABRICATING SUPERPLASTICALLY FORMED/DIFFUSION BONDED STRUCTURES

Edward D. Weisert, Rolling Hills Estates, and Suphal P. Agrawal, Torrance, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1978, Ser. No. 936,982
Int. Cl.[3] B23K *20/18, 20/22*
U.S. Cl. 228—118 16 Claims

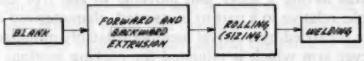


1. In the process for making a structure formed of at least two metallic workpieces of a reactive metal including the steps of treating said workpieces at selected areas with a stop-off composition to prevent bonding at said selected areas, placing said at least two workpieces into contact with each other, maintaining said workpieces under coordinated temperature-pressure-time duration conditions to produce diffusion bonding of said workpieces at preselected areas, and applying gas pressure between the contacting surfaces of said at least two workpieces to cause breakthrough at said selected areas and superplastic forming of at least one of said workpieces to stretch substantially in excess of its original surface area; the improvement which comprises utilizing a stop-off composition containing as an essential component yttria, having a particle size greater than 5 microns, and an inert organic liquid vehicle for said compound, said organic vehicle comprising a binder capable of volatilizing and leaving substantially no organic residue at elevated temperature below the diffusion bonding temperature of said reactive metal.

4,220,277
AXLE BODIES

Heinrich Hesse; Rolf Lückeville, both of Bielefeld, and Franz-Josef Henrichs, Verl, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Mannesmannufer, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,072
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805729
Int. Cl.[3] B23P *15/00;* B23K *31/02;* B21D *22/24*
U.S. Cl. 228—173 F 5 Claims

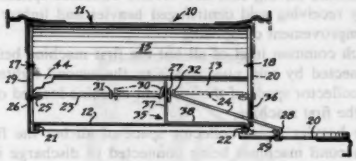


1. Method of making a semi-finished product for use as one half in an axle body, comprising the steps of:
providing an extrusion blank of particular dimensions and heating the blank to a working temperature;
extruding the blank by forward extruding a neck portion and backward extruding a hollow shell portion, there being a transition zone between the neck and shell portions being also produced by forward extrusion; and
rolling the shell portion into a nonround cross section, the wall thickness decreasing gradually at least in the transition zone towards and into the shell portion.

4,220,278
DOUBLE DOOR MAILBOX

Rae E. Hasselbring, 5336 Forest Acres Dr., Nashville, Tenn. 37220

Filed Nov. 13, 1978, Ser. No. 960,093
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—35 6 Claims

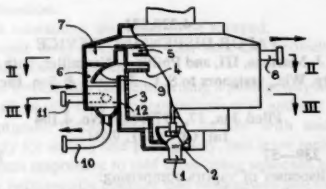


1. A mailbox comprising:
(a) an elongated mailbox housing having a front access opening and a rear access opening,
(b) a front door movable toward and away from said front access opening between a closed position and open position,
(c) a rear door movable toward and away from said rear access opening between a closed position and an open position,
(d) elongated rod means linking said front door and said rear door,
(e) the maximum length of said rod means being substantially equal to the length of said mailbox housing plus the length of the portion of said rod means extending between one of said access openings and a corresponding door in an open position when said other door is in a closed position,
(f) said elongated rod means comprising a front link rod and a rear link rod, each having front and rear end portions, first means coupling the front end portion of said front link rod to said front door, and second means coupling the rear end portion of said rear link rod to said rear door,
(g) lost motion means operatively coupling said front link rod and said rear link rod to permit relative longitudinal movement between said front link rod and said rear link rod so that both said doors may be in their closed positions at the same time, said lost motion means limiting the longitudinal extension of said front and rear link rods to said maximum length of said rod means.

4,220,279
INSTALLATION FOR THE CENTRIFUGAL EXTRACTION OF ONE LIQUID BY ANOTHER

Jean-Paul Miachon, Lyons, France, assignor to Robatel, S.L.P.I., Genas, France

Filed Feb. 12, 1979, Ser. No. 11,593
Claims priority, application France, Feb. 15, 1978, 78 04986
Int. Cl.[3] B04B *3/00*
U.S. Cl. 233—3 10 Claims



1. In an installation for contacting a first heavier liquid with a second lighter non-miscible liquid and for centrifugally extracting resulting heavier and lighter phases of the liquids in each machine, the installation including multiple centrifuging

machines connected by pipe means to pass the second lighter liquid in series from a first machine through at least one intermediate machine to a last machine, and being connected by pipe means to receive and centrifuge the first liquid in contact with the second liquid while counterflowing the heavier phase substantially from the last machine toward the first machine, each machine having a common inlet to receive both liquid phases and having first and second collector spaces respectively receiving said centrifuged heavier and lighter phases, the improvement comprising

each common inlet of all but the first machine being connected by said pipe means to the second lighter phase collector space of the adjacent machine located closer to the first machine;

the heavier phase collector space of all but the first and second machines being connected to discharge into the lighter phase collector space of another machine located beyond said adjacent machine toward the first machine; and

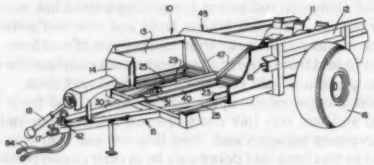
the inlet of the first machine being coupled to receive the second lighter liquid and to receive the heavier phase taken from the first collector space of the second machine.

4,220,280

MANURE SPREADER

Clarence R. Trott, Welland; Gerardus A. Veldhoven, St. Catherines, and Dennis P. Chadwick, Hannon, all of Canada, assignors to Deere & Company, Moline, Ill.

Filed Dec. 4, 1978, Ser. No. 966,011
Int. Cl.³ A01C *15/12, 15/16*
U.S. Cl. 239—1 **12 Claims**



1. A method of discharging manure in a spreader box through a beater mechanism at the rear end of the box comprising: transporting manure in the forward portion of the box horizontally rearwardly to thereby simultaneously push the manure in the rear portion of the box into the beater mechanism by shifting the floor portion and the wall at the forward portion of the box rearwardly; and after the manure in the rear portion has been discharged through the beater mechanism pushing that which was previously in the front portion and on said floor portion through the beater mechanism by shifting said wall rearwardly with respect to said floor portion.

4,220,281

VAPOR-DISPENSING DEVICE

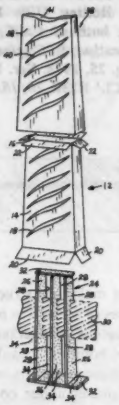
Edward J. Martens, III, and Phillip J. Neumiller, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jan. 17, 1979, Ser. No. 4,104
Int. Cl.³ A61L *9/04*
U.S. Cl. 239—57 **11 Claims**

1. A dispenser of vapors comprising:

an upstanding enclosure formed of folded flexible sheet stock and including two upstanding opposed primary walls each defining dispensing openings; and

structural means enclosed within the enclosure to provide reinforcing dimensional stability between the primary walls, the structural means defining air flow channels from one of the primary walls to the other, releasably holding a vaporizable composition, and maintaining said dimensional stability before, during, and after vaporization of said composition.

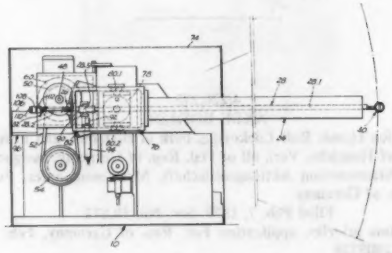


4,220,282

APPARATUS FOR PAINTING PARTS OF LARGE SURFACE AREA

Hans Behr, Lenzhalde 82, Stuttgart 1, Fed. Rep. of Germany (7000)

Filed May 24, 1978, Ser. No. 909,341
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1977, 2725038
Int. Cl.² B05B *3/18*
U.S. Cl. 239—187 **29 Claims**



1. Apparatus for painting parts of large surface area, the apparatus having a spray gun movable to and fro, and also rotatable, relative to a part to be painted, characterized in that the gun is carried by a swivel member rotatably mounted by a cantilever arm which is mounted for rocking motions about first and second axes, one at right angles to the other, and the swivel member and gun being rotatable about a swivel axis which is at right angles to both the first and second axes, the swivel member is an elongated rod parallel to the cantilever arm, the arm being mounted on a rockable shaft, the axis of which is said first axis, the spray gun being mounted on the free end of the swivel rod, (i) a positively actuatable cam control produces rocking motion of the cantilever arm about the second axis; (ii) a mechanical coupling couples the swivel rod to the cantilever arm so that rotation of the spray gun is derived from the motion of the cantilever arm about the first axis, which motion moves the spray gun to and fro and is substantially independent of the movement about the second axis

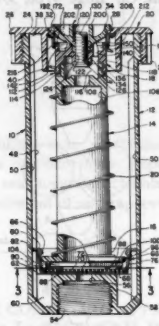
which moves the spray gun backwards and forwards, an electric motor with a shaft which drives the rockable shaft via a cam mechanism.

4,220,283

VEGETATION SPRINKLER HAVING A HAND ADJUSTMENT TO DIRECT THE SPRAY

Manning Citron, San Marino, Calif., assignor to Champion Brass Mfg. Co., Los Angeles, Calif.

Filed Jun. 4, 1979, Ser. No. 45,390
Int. Cl.³ B05B *15/10*
U.S. Cl. 239—205 **28 Claims**



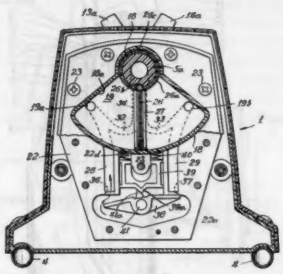
1. In a pop-up sprinkler,
a housing having a lower end for connection to a water supply,
an opening in said lower end to permit the flow of water therein,
an opening at an upper end opposite said lower end,
a riser slidably and rotatably engaged in said upper end and within said housing,
said upper end being substantially closed when said riser is therein,
a coil spring extending around said riser within the housing,
an upper end of said spring acting on a portion associated with said housing, the lower end of said spring acting on a portion associated with said riser, said spring normally holding said riser in a predetermined position substantially within said housing,
a spray nozzle forming an upper end on said riser adjacent said upper end of said housing, said nozzle and said housing upper end being adjacent when said spring is holding said riser within said housing,
said nozzle having a passage therethrough connected to a passage in said riser extending from a lower end thereof,
a relatively small opening in said riser passage to said nozzle passage, said riser having surface area to form sufficient surface thereon within said housing so that water entering said housing lower end opening at a predetermined pressure will move said riser against the force of said spring upwardly to extend the spray nozzle outwardly of said housing,
means adjacent said upper end opening of said housing being smaller than said portion associated with said riser to retain a part of said riser within said housing when said water has moved it to extend outwardly of the housing to its fully extended position,
the improvement comprising:
first means associated with said riser and second means associated with said housing,
said first and second means being engaged for relative rotation in predetermined selected amounts of arc when said riser is hand rotated in said housing for positioning the direction of spray from said nozzle.

4,220,284

OSCILLATING WATER SPRINKLER

John L. Beiswenger, Libertyville; Frank A. Smiesko, McHenry, and Dhananjay V. Chaphalkar, Lindenhurst, all of Ill., assignors to Burgess Vibrocrafters, Inc., Grayslake, Ill.

Filed Jan. 29, 1979, Ser. No. 7,034
Int. Cl.³ B05B *3/16*
U.S. Cl. 239—242 **12 Claims**



1. In an oscillating water sprinkler having a base with a horizontal sprinkler tube mounted therein for oscillating motion about its axis, a water supply inlet, a fluid motor comprising a chamber having a paddle-piston arranged therein drivingly secured to the sprinkler tube, left and right motor chamber filling channels, left and right motor chamber discharge channels, means for connecting the motor chamber discharge channels to the sprinkler tube, valve means for routing the flow of water alternately along one or the other of the left and right motor chamber filling channels and control means for manipulating said valve means in response to the angular position of the sprinkler tube, the improvement wherein said valve means includes a two-position mechancial closure element arranged to alternately directly close one or the other of the inlets to the left and right filling channels and switch means for independently propelling said closure element alternately from one position to the other when actuated by the movement of said paddle-piston past a predetermined point and for mechanically urgingly holding said closure element in said other position independent of water pressure.

4,220,285

HAND SPRAYER FOR LIQUIDS

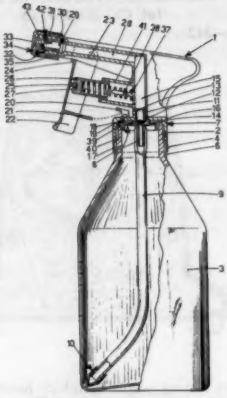
Piero Gualdi, S. Felicino, Italy, assignor to Spray Plast S.r.1, Romano d'Ezzelino, Italy

Filed Oct. 17, 1977, Ser. No. 843,034
Claims priority, application Italy, Oct. 18, 1976, 28432 A/76
Int. Cl.² B05B *9/043, 1/34*
U.S. Cl. 239—309 **9 Claims**

1. A hand operated sprayer for use with a liquid, comprising in combination:
a tank containing the liquid to be sprayed;
a sprayer body fastened to said tank and provided with a squeezable lever; and
means to vent said tank comprising a passageway in said tank to allow said tank to communicate with ambient air, and a rupturable fitting integrally formed with said sprayer body for sealing said passageway, said lever including rod means responsive to said lever being squeezed a first time for permanently opening said passageway and for simultaneously providing a permanent visual indication that the sprayer has been used by irreplaceably rupturing said rupturable fitting;
wherein said sprayer body includes nozzle means for modifying spray nebulization, comprising:
a ring nut threaded on said sprayer body and including

means defining an opening along a longitudinal axis at one extremity thereof,

a diffuser disposed within said sprayer body and said ring nut, and including ribs, said sprayer body including inner projections,



said diffuser being capable of abutting against said sprayer body along a conically tapering surface, and said diffuser being further retained within said sprayer body by cooperation of said ribs on said diffuser with said inner projections on said sprayer body, and

an O ring disposed in a peripheral groove on said sprayer body underlying said ring nut to prevent liquid seepage.

4,220,286

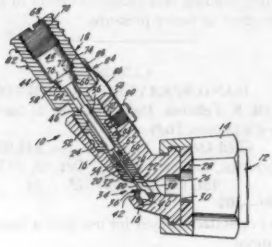
ADJUSTABLE SPRAY TIP

John D. Geberth, Jr., Rifle Camp Rd., West Paterson, N.J. 07424

Filed Feb. 21, 1978, Ser. No. 879,263

Int. Cl.[2] B05B *1/32*

U.S. Cl. 239—455 **9 Claims**



1. An adjustable spray nozzle for use with a spray device adapted for hydraulically atomizing and spraying liquids, the spray device having conduit means communicating with a source of liquid under pressure, said adjustable spray nozzle including:

(a) a spray nozzle housing including means for securing said housing to said spray device;

(b) a fluid bore in said housing communicating with said conduit means and terminating in a spray opening in said housing;

(c) A valve bore in said housing intersecting said fluid bore adjacent said spray opening;

(d) a valve stem adapted for adjustable movement in said valve bore to vary the size of said spray opening, said valve stem being formed of a tough material having bonded to the end thereof a hard, erosion-resistant material; and

(e) means for adjustably moving said valve stem in said valve bore externally of said spray nozzle housing.

4,220,287

PROCESS FOR THE TREATMENT OF OATS

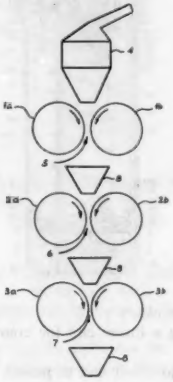
Michael P. Boczewski, Statesville, N.C., assignor to Maple Leaf Mills Limited, Toronto, Canada

Filed Feb. 15, 1979, Ser. No. 12,334

Claims priority, application United Kingdom, Mar. 23, 1978, 11805/78

Int. Cl.[3] B02C *4/06, 9/04*

U.S. Cl. 241—9 **8 Claims**



1. A process for the separation of dehulled oats into fractions differing in composition, said process comprising:

(a) admixing comminuted dehulled oats with an organic solvent, said oats having been comminuted by passing dehulled oats between at least one pair of rollers, the rollers of each pair being smooth-surfaced rollers spaced apart at a distance of not more than 0.75 mm, at least one pair of rollers being spaced apart at a distance of 0.025–0.25 mm, and said solvent being a solvent for oil in the oats, and

(b) separating the admixture of comminuted oats and solvent into at least two fractions, the solid components of said fractions differing in composition.

4,220,288

MILL ROLLER CONTROLLING APPARATUS

Thomas W. Gatley, North Bundaberg, Australia, assignor to The Bundaberg Foundry Company Limited, Queensland, Australia

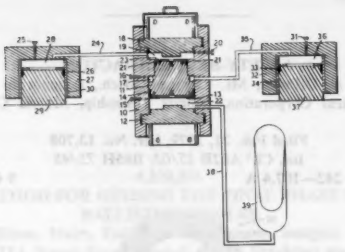
Filed Dec. 4, 1978, Ser. No. 966,391

Int. Cl.[3] B02C *4/32*

U.S. Cl. 241—37 **9 Claims**

1. Apparatus for controlling movements of a crushing mill roller or the like comprising a pair of supporting hydraulic rams supporting opposite ends of a mill roller and each having a variable volume chamber subject to variations in fluid pressure, an auxiliary hydraulic ram assembly common to said hydraulic rams and having spaced cylinder heads and a single piston between the cylinder heads, said auxiliary hydraulic ram having separated chambers on opposite sides of said piston and an intermediate chamber between and isolated from said separated chambers, the intermediate chamber being in part volumetrically defined by surfaces of said piston, fluid pressure means connected in communicating relationship with one of said separated chambers of the auxiliary hydraulic ram to maintain a constant pressure in such chamber, and means connecting the variable volume chamber of one supporting hy-

draulic ram in communicating relationship with the other separated chamber of the auxiliary ram and connecting the variable volume chamber of the other supporting hydraulic ram in communicating relationship with the intermediate



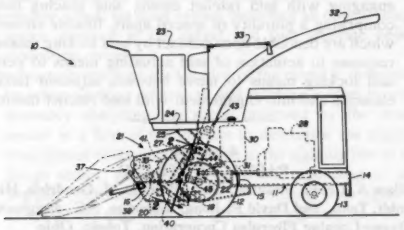
chamber of the auxiliary ram, whereby movement of said single piston of the auxiliary ram responsive to pressure changes in either of said separated chambers of the auxiliary ram will cause displacement of said supporting hydraulic rams in unison.

4,220,289

FORAGE CONVEYING APPARATUS

Frederick W. Phillips, Leola; Edward H. Priepke, Stevens, and Robert A. Wagstaff, New Holland, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 3, 1979, Ser. No. 26,500
Int. Cl.³ B02C *18/22*
U.S. Cl. 241—60 **12 Claims**



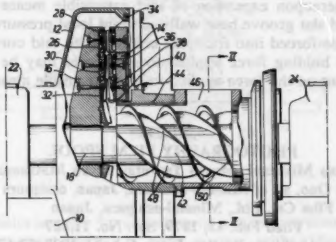
1. In a forage harvester:
(a) a ground supported mobile frame having a front to rear longitudinal axis and a vertical axis
(b) crop cutting means and means for propelling said cut crop mounted on said frame
(c) said cut crop propelling means including a first means for directing said crop rearwardly on said longitudinal axis
(d) blower means mounted on said frame in line with the longitudinal axis rearwardly of said cutting and propelling means for receiving said cut and propelled crop
(e) said blower means including a propeller having its plane of rotation inclined from the vertical axis and transverse to said longitudinal axis, and
(f) said blower having a bottom crop receiving means and a top generally vertical crop discharging means and having said propeller when operating moving said cut crop from said bottom crop receiving means upwardly to said top generally vertical crop discharging means, and
(g) said propeller including a cone means including an apex facing generally toward said crop cutting means for aiding in directing said crop downwardly in said bottom crop receiving means.

4,220,290

CONVEYOR DEVICE FOR FEEDING LIGNOCELLULOSIC MATERIAL TO A DISC-TYPE GRINDING APPARATUS

Johan G. I. Johansson, Taby, Sweden, assignor to Defibrator Aktiebolag, Stockholm, Sweden

Filed Jan. 22, 1979, Ser. No. 5,378
Claims priority, application Sweden, Jan. 24, 1978, 7800881
Int. Cl.³ B02C *7/11*
U.S. Cl. 241—247 **4 Claims**



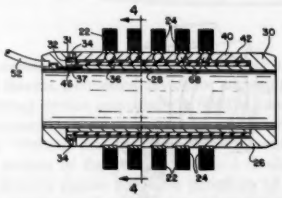
1. In a grinding apparatus in which lignocellulosic material is ground in a grinding space defined between a pair of grinding discs which are mounted on a shaft to rotate relatively to one another within a housing into which the material is advanced through a feed-in sleeve having a wall surrounding the shaft, from an intake opening to a feed-in zone, by conveyor means carried by said shaft to rotate within said sleeve, the improvement comprising:
(a) solid inner screw conveyor means mounted on said shaft;
(b) outer ribbon screw means supported on the crest of the flights of said inner screw means for common rotation therewith;
(c) said inner screw means having a pitch steeper than that of said outer screw means; and
(d) the flights of said inner means and said outer screw means being positioned relative to one another so that said inner screw means will propel the material mainly in a radially outward direction against the wall of said sleeve and fill the grooves of said ribbon-like screw means to be advanced axially by the latter in the form of a pipe into the feed-in zone during the common rotation of said screw means.

4,220,291

APPARATUS FOR WINDING TAPE ON CORES

Robert B. Papa, 127 Midvale Dr., Cranston, R.I. 02920

Filed Aug. 27, 1979, Ser. No. 70,303
Int. Cl.³ B65H *19/04, 75/24*
U.S. Cl. 242—56.9 **5 Claims**



1. Apparatus for holding a plurality of cylindrical winding cores while strip material is simultaneously wound thereon comprising, a mandrel of generally overall cylindrical shape having at least two circumferentially spaced longitudinally extending openings provided therein, a slat segment having an outer arcuate surface generally corresponding to that of said

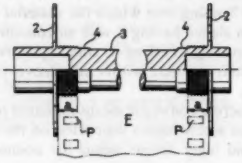
mandrel positioned in each said opening, each said slat including a plurality of longitudinally spaced grooves laterally extending across the outer surface thereof, said cores adapted for disposition over said mandrel and at least partially into said grooves and wherein the core side walls are adapted to contact sidewalls of said grooves, each said groove including a base wall having at least one opening through which a member adapted to apply local pressure to inner surface portions of said cores is adapted to radially extend, expansible means disposed in said mandrel and adapted to simultaneously contact inner surface portions of both said slats and said local pressure members whereupon expansion of said expansible means causes both said slat groove base walls and said local pressure members to be forced into frictional contact with said cores such that the holding force applied to said cores may be varied dependent on the force applied to said expansible means.

4,220,292

PHOTOGRAPHY FILM SPOOL

Shigemitsu Mizutani; Masao Tsuruta; Yasuo Matsumoto, and Kengo Ono, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 13, 1979, Ser. No. 11,827
Claims priority, application Japan, Feb. 14, 1978, 53-17374[U]
Int. Cl.[3] B65H *75/18*
U.S. Cl. 242—71.8 **8 Claims**



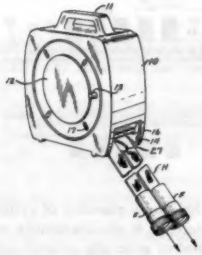
1. A spool for 35 mm photography film comprising: a circular elongated shaft having two outer shoulder portions of the same diameter and a center portion of smaller diameter than said shoulder portions, said shoulder portions having their outer surfaces provided with a mat surface means for contacting a photographic film wound on the spool and for preventing the production of the static marks on the film surface in contact with said mat surface means.

4,220,293

HOSE CARRIER

John L. Gename, Naperville, Ill., assignor to Richco Plastic Company, Chicago, Ill.

Filed Oct. 26, 1979, Ser. No. 88,550
Int. Cl.[3] B65H *75/38, 75/28*
U.S. Cl. 242—86.1 **14 Claims**



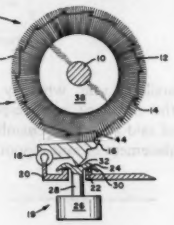
1. A hose carrier for storing and transporting a length of collapsible hose comprising an apertured enclosure, a reel rotatable in said enclosure, means for rotating said reel, and a fixture extendable into said enclosure aperture and connected to and rotatable with said reel, said fixture having a tongue for removably gripping said hose and drawing it into said enclosure for winding onto said reel when said reel is rotated in one direction.

4,220,294

SAFETY BELT RETRACTOR

Donald A. DiPaola, Mt. Clemens, Mich., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 21, 1979, Ser. No. 13,708
Int. Cl.[3] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **9 Claims**



1. An improved safety belt retractor comprising a ratchet means, a movable locking means which is engageable with said ratchet means, and an actuating means which is actuable in response to a predetermined acceleration for engaging said locking means with said ratchet means, wherein the improvement comprises:

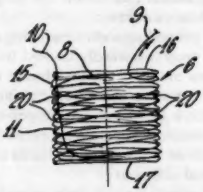
spacing means normally preventing said locking means from engaging with said ratchet means, said spacing means comprising a plurality of spaced apart, flexible elements, which are bendable upon contact by said locking means in response to actuation of said actuating means to permit said locking means to move between adjacent flexible elements and into engagement with said ratchet means.

4,220,295

PACKAGED STRAND

William A. Green, Swanton, Ohio; William M. Goodrich, Humboldt, Tenn., and David R. Long, Anderson, S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 21, 1979, Ser. No. 13,694
Int. Cl.[2] B65H *55/00*
U.S. Cl. 242—170 **4 Claims**



1. A package comprising:

a wound body of strand having an outer cylindrical portion; and

an elastic membrane convolutely wound about the cylindrical portion of said body from about 2 to about 4 times, the membrane being of a sufficient thickness and being stretched sufficiently to partially collapse as the strand is withdrawn from the interior of the body such that the

membrane mechanically captures the strand of the outer cylindrical portion to retain such strand along said membrane until said strand is withdrawn from the package at a predetermined time.

4,220,296

METHOD FOR GUIDING THE FINAL PHASE OF BALLISTIC MISSILES

Klaus Hesse, Holm, Fed. Rep. of Germany, assignor to LICENTIA Patent-Verwaltungs-G.m.b.H, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,379

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650380

Int. Cl.[2] F41G 7/00

U.S. Cl. 244—3.14 3 Claims

1. A method for correcting the final phase of a ballistic projectile against stationary and moving targets by means of an externally transmitted signal comprising the steps of:

providing a dual tracking system including an optical image sensor directed at the target and two separate object evaluation circuits;

continuously tracking the location of the target to determine its actual position relative to said tracking system by continuously analyzing the scene observed by the image sensor in a first of the circuits to determine the angular coordinates of the target relative to the sighting line of the image sensor, providing a signal corresponding to said angular coordinates of the target, utilizing said signal to continuously automatically adjust the sighting line of the image sensor onto the target, and feeding the data as to the angular coordinates to a fire control computer;

simultaneously continuously tracking the position of the projectile by evaluating the scene observed by the image sensor in the other of said circuits and providing a signal corresponding to the angular coordinates of the actual position of the projectile;

utilizing said signal corresponding to the angular coordinates of said target to continuously provide a signal corresponding to the angular coordinates of the nominal position of the projectile;

continuously comparing the signal corresponding to the actual position of the projectile with that corresponding to the nominal position of the projectile to determine any deviation between the compared signals;

from said deviation, generating a correction signal, as to magnitude and direction, for the path of the projectile;

transmitting said correction signal to the projectile as a wireless coded signal; and

in said projectile, translating said correction signal, together with measurements in said projectile for the dynamic flight characteristics of the projectile, into a triggering pulse for actuating the desired flight path correction for the projectile.

4,220,297

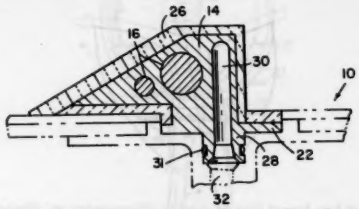
FINLET INJECTOR

Darell B. Harmon, Jr., Huntsville, Ala., and Arnold W. Foss, Santa Monica, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1978, Ser. No. 971,459

Int. Cl.[3] B64C 21/08

U.S. Cl. 244—3.21 4 Claims



1. A finlet injector for mounting on a missile structure, said finlet injector including a body portion with a front end streamlined portion, heat insulating means mounted on external surfaces of said body portion, passage means in said finlet injector for injecting fluid into the atmosphere about said finlet injector, said passage means including an inlet passage in said body portion that communicates with a plurality of outlet injector passages that inject the fluid to the atmosphere, said heat insulating means having a larger opening therein at each of said outlet injector passages to prevent fluid injected from said outlet passages from impinging on said heat insulating means, and said body portion having means for mounting said finlet injector on the side of a missile.

4,220,298

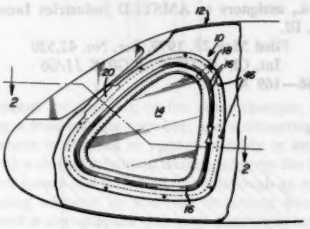
REMOVABLE SOFT DOOR FOR AIRCRAFT

Kathryn E. Willis, 3560 SE. Russell Ct., Hillsboro, Oreg. 97123

Filed Oct. 30, 1978, Ser. No. 956,258

Int. Cl.[2] B64C 1/14

U.S. Cl. 244—129.5 7 Claims



5. In combination with a helicopter having a door opening disposed therein, a covering device for enclosing said opening, said covering device comprising a flexible panel sufficient in size to surround said door opening; an attachment means comprising a "Velcro" fastener disposed in a continuous manner about a portion of the periphery of said flexible panel; snap fastener devices spaced about the periphery of said panel and in communication with said "Velcro" fastener; a slide fastening device disposed on said flexible panel and spaced from the peripheral edge thereof for allowing removing of the center of said flexible panel; a transparent window disposed spaced inwardly from said slide fastening device; and hinge means disposed on the periphery of said flexible panel and in alignment with a portion of said "Velcro" fastener.

4,220,299

AIRFOIL SUIT

William G. Motter, 867 Ahua St., Honolulu, Hi. 96819

Continuation of Ser. No. 831,336, Sep. 7, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,542

Int. Cl.[2] B64D *17/00*

U.S. Cl. 244—143 **11 Claims**

1. Airfoil suit apparatus comprising

a one piece body covering having torso portions arm portions, and leg portions, and two longitudinal wing-storing pockets extending downward along sides of the torso portions and midway down the leg portions, the wing-storing pockets having cooperating closures for opening and closing the pockets,

wings having inward edges permanently connected to the torso portions between the closures and the wings having upward edges removably connected to the arm portions, whereby the wings only extend to a point midway down the leg portions and whereby the wings may be released from the pockets and connected to the arm portions for use and may be disconnected from the arm portions, folded and stored within the longitudinal pockets leaving a suit with close-fitting appearance.

4,220,300

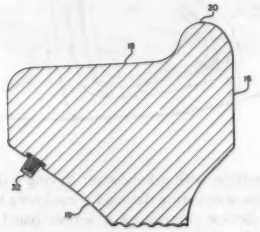
THERMAL MONITOR FOR RAILROAD WHEELS

Harold J. Reicher, Westmont, Ill., and Leslie M. Hepler, Arnold, Md., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed May 25, 1979, Ser. No. 42,520

Int. Cl.[2] B61K *9/12;* **G01K** *11/06*

U.S. Cl. 246—169 A **3 Claims**



1. A railway wheel comprising a hub, a rim and a plate portion extending generally radially from said hub to said rim, further comprising at least one annular cavity means having a bottom inner lip portion and an outer top in said plate portion near said rim, the bottom portion of the cavity means being of a greater diameter than the outer top portion, and temperature monitoring means located in said cavity means, said temperature monitoring means comprising a rim means and a cap means, said rim means being expanded during insertion within said cavity means to hold said temperature monitoring means in direct contact with said cavity means, said cap means extending outward beyond said cavity means during normal operation to readily indicate that said railway wheel has not been subjected to overheating during operation, and said temperature monitoring means evacuating from said cavity means by the melting of said rim means, thus leaving said cavity means empty to readily indicate that said railway wheel has been subjected to overheating during operation.

4,220,301

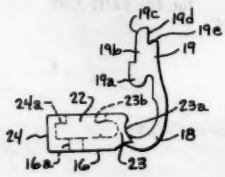
FLEXIBLE STRAP TYPE MOUNTING DEVICE

Alfred G. Jacobs, and Richard L. Seiders, both of Madison, Wis., assignors to Safe-T-Gard, Inc., Madison, Wis.

Filed May 7, 1979, Ser. No. 36,845

Int. Cl.[3] F16L *3/08*

U.S. Cl. 248—74 PB **10 Claims**



8. A flexible strap type mounting device for attaching an item to a support, the mounting device being molded of one-piece resilient polymeric material and comprising, a mounting base adapted for attachment to a support and having spaced side and end wall means at one side thereof defining a cavity, one of said end wall means providing an abutment at the outer side of the cavity for engagement with the item and a keeper flange at the inner side of the cavity spaced from the base, an elongated flexible strap having one end integrally joined to said one end wall means and arranged to form an item retaining loop outwardly of said abutment when the distal end of the strap overlies the keeper flange, an elongated head integrally joined intermediate its ends to the distal end of the strap, said elongated head being thicker and more rigid than said strap to be flexibly movable as a unit relative to said strap, said head having a width to be receivable between said side walls and a nose at one end portion engageable with said keeper flange, when the elongated head is moved to a latch position overlying the mounting base, and cam means on the other end portion of said head engageable with the other end wall means for forcing the head toward said one end wall means as the head is moved into its latch position.

4,220,302

NURSING BOTTLE HOLDER

Jarold L. Hampton, and Diane M. Hampton, both of 1104 S. Ivy, Nampa, Id. 83651

Filed Jul. 21, 1978, Ser. No. 926,840

Int. Cl.[2] A47D *15/00*

U.S. Cl. 248—102 **4 Claims**

1. A nursing bottle holder comprising:

an elongated flexible shoulder strap having an inner surface and an outer surface and adapted to obliquely encircle a shoulder and waist of a person, said strap including a

pliable pad vertically disposed on the outer surface thereof, said pad having a multiplicity of plastic connectors thereon; and

an elongated flexible bottle strap having an inner surface and an outer surface and adapted to engage and clampingly encircle a nursing bottle, said bottle strap including a

pliable pad vertically and immovably disposed on the outer surface thereof, said pad having a multiplicity of plastic connectors thereon, the connectors operable to universally and temporarily engage the connectors of the shoulder strap pad to hold the nursing bottle in a selected vertically planar position.

4,220,303

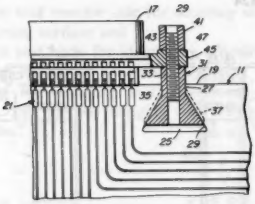
EDGE MOUNTING DEVICE

Clayton L. Stoldt, North Warren, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 10, 1978, Ser. No. 950,187

Int. Cl.[2] H05K *1/04, 7/12*

U.S. Cl. 248—205 R **2 Claims**



1. Apparatus for mounting an electrical component on the edge of a printed wiring board comprising a demountable member having a neck and shoulders, each shoulder extending from either side of said neck, said demountable member being adapted to be mounted within an opening in said printed wiring board adjacent said edge, a groove in each shoulder adapted to engage an interior edge of said opening, fastener adapted to engage said electrical component for securing said component to said demountable member.

4,220,304

ATTACHMENT FOR ELECTRIC TORCHES

Chung-Chee Wong, Kowloon, Hong Kong, and David R. Dalton, Sydney, Australia, assignors to Sonca Industries Limited, Kowloon, Hong Kong and Union Carbide Australia Limited, Sydney, Australia

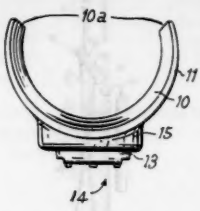
Filed Jun. 26, 1978, Ser. No. 919,305

Claims priority, application United Kingdom, Mar. 14, 1978, 10107/78

Int. Cl.[2] A47B *96/06*

U.S. Cl. 248—231 **3 Claims**

1. An attachment for converting a conventional electric flashlight into one that can be attached to a magnetic surface, said attachment being attachable to a cylindrical barrel of an electric flashlight having an operating switch and switch housing thereon, said attachment comprising; resilient body shell means having the shape of a partial sleeve for being snapped over said cylindrical barrel for gripping said cylindrical barrel firmly, said resilient body shell means having switch housing surrounding means for accommodating a switch and switch housing therein and preventing said resilient body shell means



from axially or rotationally sliding on said barrel and having a hole therein for providing access to said switch, said resilient body shell means further having a protruding portion having one or more magnets attached thereon, and protruding portion projecting from said resilient body shell means for allowing said resilient body shell means to be magnetically attached to a magnetic surface.

4,220,305

SUPPORTS FOR SHELVING OR THE LIKE

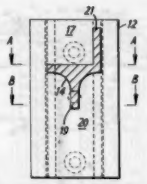
Ivor R. Pollard, 42 St. Johns Wood Ct., St. Johns Wood Rd., London, England

Filed Nov. 30, 1978, Ser. No. 964,926

Claims priority, application United Kingdom, Dec. 6, 1977, 50760/77

Int. Cl.[2] A47G *29/02;* **A47F** *5/00*

U.S. Cl. 248—245 **16 Claims**



1. A support for shelving or for other elongate materials, comprising a load-bearing member, and a mounting member each of which is adapted to engage slidably in interlocking manner with a slotted mounting fixture, wherein the load-bearing member has an end which projects through an aperture in the mounting member to abut the mounting fixture when installed, and is also adapted to engage slidably in interlocking manner with the slotted mounting fixture.

4,220,306

ADJUSTABLE HANGING DEVICE

Ronald E. Cueto, 61 Ahmad St., Opa Locka, Fla. 33054, and Arthur N. Cohen, 270 NE. 156th St., North Miami Beach, Fla. 33162

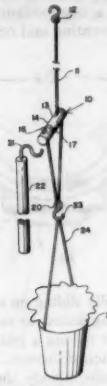
Filed Apr. 13, 1979, Ser. No. 30,030

Int. Cl.[2] B42F *13/00*

U.S. Cl. 248—328 **7 Claims**

1. An adjustable hanging device comprising a substantially elongated member having end portions, a bore extending through said elongated member at each of said end portions, a pliable member of desired length having a free end, said pliable member extending through one of said bores to beyond said elongated member and returning to extend through the other

of said bores, means securing said free end of said pliable member preventing the sliding of said pliable member through said other of said bores and peripheral groove means mounted about said elongated member in closer proximity to said other



of said bores for engagement by a pole for positioning said elongated member in a substantially horizontal position whereby said pliable member extending through said one of said bores is free to slide therethrough.

4,220,307

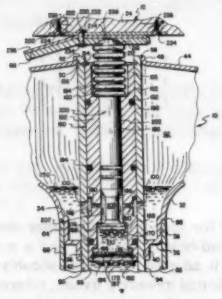
MEDIAL STOOLS

Dean H. Hale, 2424 N. Main St., Logan, Utah 84321

Filed Feb. 9, 1979, Ser. No. 10,659

Int. Cl.³ F16M *11/00*

U.S. Cl. 248—404 **12 Claims**



1. A medical stool and the like having a selectively variable effective length, the stool comprising:

top seat means;

bottom base means;

intermediate generally hollow post means, pressurizing tank means, valve means and control means;

the tank means comprising mounting means for joining the tank means to the seat means, an interior hermetically sealed generally annular reservoir containing liquid in the bottom for selective communication to and from the hollow interior of the post means across the valve means and gas under pressure above the liquid, the tank means further comprising a hollow center external of the tank reservoir;

the control means by which the valve is controlled comprising a manual actuator at least partially disposed directly beneath the seat means;

the post means comprising hollow ram tubular means and hollow cylinder tubular means, the two tubular means having juxtaposed ends telescopically reciprocably interconnected, the other end of one of the tubular means being connected in loadtransferring relation to the tank means, the other end of the other tubular means being connected in load transferring relation to the base means, the hollow interior of the two tubular means being in substantially open and unrestricted fluid communication one with the other to thereby form a composite variable volume liquid reservoir;

the valve means being disposed substantially entirely within the hollow of the tank means and comprising valve shaft means urged by bias means away from an open position to a closed position and stationary elongated sleeve means having liquid flow path means extending between the tank reservoir and the valve shaft means, which valve shaft means are reciprocably disposed within the sleeve means, the valve shaft means comprising valve head means normally engaging valve seat means and recess means accommodating liquid flow across the valve head means and along the flow path means between the tank reservoir and the variable volume reservoir to selectively elevate and lower the seat by changing the effective length of the post means.

4,220,308

CONSOLE FOR A VEHICLE SEAT

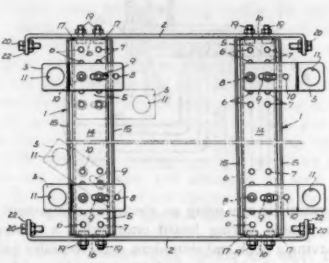
Werner Strien, Stuttgart; Walther Göldner, Ebersbach, both of Fed. Rep. of Germany, and George J. Venieris, Marina Del Ray, Calif., assignors to Recaro GmbH & Co., Kirkcheim, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,348

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1978, 2828477

Int. Cl.² F16M *13/00*

U.S. Cl. 248—424 **10 Claims**



1. A console for connecting a vehicle seat with attachment points provided on a floor of a vehicle, comprising:

two substantially identical cross supports being connected together at their two side surfaces with respective side supports at selectable locations;

each of said side supports having means for mounting the vehicle seat;

each of said two substantially identical cross supports being provided at least in the area of two longitudinal end sections thereof with two spaced-apart adjacent rows of aperture means extending in the longitudinal direction of the two substantially identical cross supports;

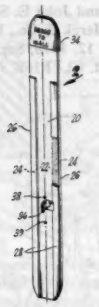
said aperture means being selected by pairs for the protrusion of means for connecting at least two straps to each of the two substantially identical cross supports; and

said straps being attached at the attachment points on the floor of the vehicle and being connected to their respective substantially identical cross supports in variable positions.

4,220,309
METHOD AND APPARATUS FOR POSITIONING HANGING DEVICES ON A WALL

Harry Eisen, 16421 Chatsworth St., Granada Hills, Calif. 91344, and Walter D. Kimmelman, Chatsworth, Calif., assignors to Harry Eisen, Granada Hills, Calif.

Filed Oct. 24, 1978, Ser. No. 954,315
Int. Cl.[2] F16M *13/00*; A47G *1/17, 1/20*
U.S. Cl. 248—542 19 Claims



1. An apparatus for positioning a hanging device on a supporting surface in a position to hang a frame at a desired location on said supporting surface, said apparatus comprising:

a generally flat elongated body having an obverse and a reverse side;

means on said body for aligning said body with respect to an attachment device on said frame;

means on said obverse side for securing said body to said frame;

means on said reverse side for securing said body to said supporting surface; and

means on said body for identifying a position on said supporting surface at which said hanging device is to be located for engaging said attachment device on said frame, and thereby hanging said frame at said desired location.

4,220,310
EXTENSIBLE DISPLAY MOUNTING ASSEMBLY

Charles A. Jantzen, 190 Alps Rd., and L. Arthur Jantzen, 186 Fairfield Rd., both of Wayne, N.J. 07470

Filed Jul. 20, 1979, Ser. No. 59,282
Int. Cl.[3] A47F *13/06*
U.S. Cl. 248—544 4 Claims

1. A display mounting assembly for releasably mounting light weight display materials at elevated locations, comprising:

a magnetically adherable mounting member including a magnet and a circular ring member disposed in spaced relation therewith;

telescopically extensible pole means;

a cup member mounted at the extensible end of said telescopically extensible pole means;

said cup member having a slotted base portion sized to selectivity pass said circular ring member therethrough and support said magnet in a first releasable position; and

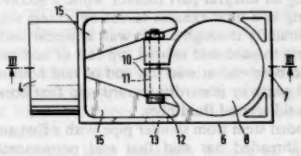
a pin member disposed in spaced parallel relation with the extensible end of said telescopically extensible pole means and peremetically engageable with said circular ring member to support said magnet in a second releasable

position at substantially right angles to said first releasable position.

4,220,311
CLAMPING BLOCK FOR ELECTRICAL HAND DRILL

Robert Wolff, Im Kiesacker, Engeln, Fed. Rep. of Germany (5446)

Filed Apr. 24, 1979, Ser. No. 32,861
Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821132
Int. Cl.[3] F16M *11/00*; B23B *47/00*
U.S. Cl. 248—645 6 Claims



1. In combination, a machine mounting block and a screw clamp to receive said machine mounting block for mounting an electrical hand drill in one of several positions:

said screw clamp comprising a generally C-shaped body having a bottom connected to a back and a top perpendicular to the back, the bottom provided with a threaded bore and an elongated clamping screw element threadedly engaging the bottom, said back of said screw clamp being provided with a bore adapted to receive a projecting plug of said machine mounting block and said top of said screw clamp being provided with a bore adapted to receive a projecting plug of said machine mounting block, thereby providing a double cavity in said screw clamp for back and top portions in mounting an electrical hand drill;

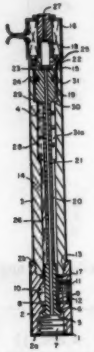
said machine mounting block being formed with a rectangular top formed of a front square plate portion and a back portion, perpendicular sides and end and a projecting plug which is adapted to fit into the back cavity or the top cavity of said screw clamp;

a molded clamping ring in said back portion of said machine mounting block, said clamping ring formed with split clamping projections separated by a slit; and

a screw fastening means which passes through said split clamping projections for tightening the clamping projections to fix the electrical hand drill in said clamping ring

and for loosening the said projections for removal of the drill from said clamping ring.

4,220,312
CRYOSOLENOID VALVE
Richard S. Pauliukonis, 6660 Greenbriar Dr., Cleveland, Ohio 44130
Filed Dec. 12, 1977, Ser. No. 859,810
Int. Cl.³ F16K *31/06, 31/122, 49/00*
U.S. Cl. 251—30 **6 Claims**



1. An internally piloted cryogenic solenoid valve comprising:

a valve housing having a first bottom end and a second top end interconnected by a bore passing therethrough, incorporates a means for valving substantially midway thereof,

at least a pair of fluid ports in said housing and a first bore end serving as a first port for a fluid supply thereto comprising an integral part thereof while a second fluid port serving as a fluid exhaust therefrom enters said bore perpendicularly through a side wall adjacent said means for valving toward said second top end of said housing,

a second bore end at said top end of said housing counterbored partway inwardly toward said first bore end adjacent said second fluid port,

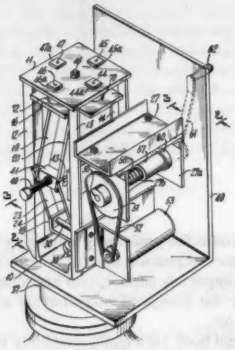
an extended stem from slender pipe with a first and a second ends threaded has said first end permanently secured inside said second bore end so as to protrude from said top end of said housing while said second end thereof a substantial distance away therefrom is closed by a coaxially mounted solenoid operator having a plunger axially movable inside said operator in a working relationship with said means for valving,

a long small diameter thin wall tubing, passing centrally through the inside of said extended stem of said slender pipe, terminates at one end inside said valve housing with a valve poppet of said means for valving while the other opposite tubing end connects to a piston of a diameter larger than the diameter of said valve poppet, said piston, housed adjacent said solenoid operator, in combination therewith forms a fluid cavity inside said second end of said extended stem,

said valve poppet and said piston so interconnected by said thin wall tubing receives a pilot port passing centrally therethorugh, comprising in combination a piston assembly for valve actuation wherein said plunger of said operator controls the fluid flow through said pilot port into said fluid cavity thereby providing means for valve operation from a first valve closed to a second valve open positions by a vapor entering and leaving said fluid cavity, including means for venting said fluid cavity,

wherein when said solenoid operator is energized electrically, said fluid cavity and said piston become pressurized exerting an end force large enough to move said piston assembly from first to second positions rendering valve open, de-energization of said solenoid operator automatically returns said valve into said first valve closed position by a fluid pressure exerting an opposite end force at said valve poppet and maintaining valve closed when said piston is not subjected to said pilot pressure.

4,220,313
VALVE OPERATOR
Kenneth M. Petersen, and John E. Soulier, both of San Diego, Calif., assignors to Merck & Co., Inc., Rahway, N.J.
Filed May 12, 1978, Ser. No. 905,246
Int. Cl.³ F16K *31/05*
U.S. Cl. 251—280 **2 Claims**



1. In a valve operator for a sliding stem valve for controllably opening and closing a valve diaphragm, said valve operator comprising (1) lower linkage arms pivotally connected at their lower portions to said sliding stem valve and pivotally connected at their upper portions to lower portions of upper linkage arms, (2) said upper linkage arms being pivotally connected at their upper portions to a movable pressure plate attached by guide pins to a top stationary pressure plate such that said movable pressure plate remains substantially parallel to said top stationary pressure plate and (3) actuating means for moving said linkage arms relative to each other such that said sliding stem valve moves relative to said top stationary pressure plate, the improvement which comprises a spring positioned between said movable pressure plate and said top stationary pressure plate such that the movement of said movable pressure plate toward said top stationary pressure plate is limited thereby.

4,220,314
BUTTERFLY VALVE STRUCTURE
C. Thomas Lynch, Berkeley, Calif., assignor to Axel Johnson Corporation, San Francisco, Calif.
Filed Mar. 29, 1979, Ser. No. 25,128
Int. Cl.³ F16K *1/228*
U.S. Cl. 251—307 **4 Claims**

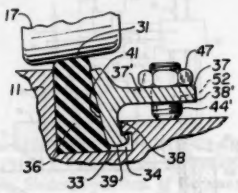
1. A butterfly valve construction wherein a rotatable valve disc is supported internally of the valve casing member through which fluid is adapted to flow when the disc is rotated to align its planar surface with the fluid flow direction and in which fluid flow is adapted to be arrested when the disc is rotated to a position transverse to the fluid flow direction, comprising:

a circumferential recess formed internally of the casing wall and extending about the inner periphery thereof, said recess having a circumferential undercut portion extending into the casing wall and having an overhanging extension over a portion of the recess;

an elastomeric ring member located partially within the

recess, said member being spaced laterally from the overhanging extension and having one side snug against the side of the recess opposite from the overhang;

a plurality of clamp ring segments disposed along the recess, each said segment including a surface bearing against the side of the ring member opposite from said one side, said bearing surface terminating in a hooked end engaging the undercut, said segments each further including an integral pivot arm extending substantially perpendicularly from



the underside of the bearing surface and generally parallel to the casing wall; and

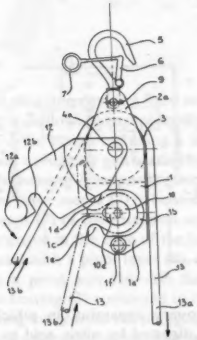
a plurality of extension members projecting from the respective pivot arms into contact with the casing wall, each said extension member being independently adjustable to pivot the associated pivot arm about its hooked end and compress the ring member between the side of the recess and the bearing surface of the associated segment to control the tightness of the seal provided by the ring member.

4,220,315

VERSATILE PULLEY

Marcel P. Gris, Cloyes-sur-le-Loir, France, assignor to Societe Anonyme Dite: Etablissements Catu S.A., Bagneux, France

Filed Jul. 21, 1977, Ser. No. 817,605
Claims priority, application France, Jul. 29, 1976, 76 23143
Int. Cl.[2] A62B 1/14
U.S. Cl. 254—236 **1 Claim**



1. In a rescue device for lowering persons,

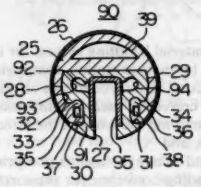
an ordinary pulley whose pintle is disposed about a horizontal axis and is borne by a rigid shell provided at its upper part with means for overhead suspension from a fixed point, closed on its two faces and opened on both its ends and which is adapted to receive a handling or hauling rope, said shell further comprises a braking system independent of and located below the pulley and wherein one of said faces of said shell comprises a flap rotatably mounted adjacent said pintle and coaxial therewith and rotatable to expose the braking system, and wherein the braking system is housed in an extension of the lower part of the shell, and is constituted by a C-shaped cavity and containing a mobile roller in horizontally reciprocal coplanar relationship with said pulley and around which the rope may be placed forming a loop so that said roller is moved towards the opening of the cavity jamming the said rope in the said opening with a force which is dependent upon the pulling force of the rope.

4,220,316

TOP RAIL FOR USE ON RAILING CONSTRUCTION

Hiromitsu Naka; Takeshi Miyashiro; Hidetoshi Kawase; Yoshihde Sugimoto, all of Saitama-ken; Tsutomu Shirataki, and Hiroshi Morishita, both of Hokkaido, all of Japan, assignors to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Sapporo, Japan

Filed Jul. 21, 1978, Ser. No. 926,743
Claims priority, application Japan, May 27, 1978, 53/62166
Int. Cl.[2] E04H 17/14
U.S. Cl. 256—59 **10 Claims**



1. A top rail for use on a railing construction or the like comprising

a main top rail member having a support post receiving slot extending in the longitudinal direction of said top rail and opening downwardly, and dovetail tenon slots formed on the opposite sides thereof and extending in the longitudinal direction of said top rail;

a resilient cushion layer fitted on said main top rail member, a main top rail member receiving groove extending in the longitudinal direction of said receiving cushion into which said main top rail member fits for mounting said cushion layer on said main top rail member, and dovetail tenons projecting from the opposite side walls of said groove in the main top rail member and received in said dovetail tenon slots; and

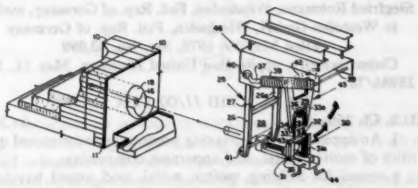
a surface protection layer integrally formed on the outer surface of said resilient cushion layer.

4,220,317

METHOD OF OPENING TAPHOLES IN A PHOSPHORUS FURNACE

Arden V. Tarum, Beaverton, Oreg., and Gordon H. Scherbel, Pocatello, Id., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 12, 1978, Ser. No. 950,774
Int. Cl.[2] C21B 7/12
U.S. Cl. 266—45 **5 Claims**



1. A method of opening a taphole formed by a boretube which extends through the wall of a phosphorus furnace,

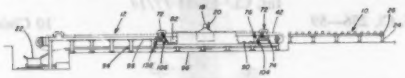
which comprises supporting a gun on a moveable carrier in a position above and parallel with said boretube, moving the gun and carrier downward in an arc so that the barrel of the gun is in axial alignment with the boretube and firing at least one slug through the gun barrel into the boretube.

4,220,318

IN-LINE MATERIAL HANDLING SYSTEM

Harry E. Anderson, 307 Foxcroft Rd., Pittsburgh, Pa. 15220, and Raymond E. Heasley, 38 Silver La., McKees Rocks, Pa. 15136

Filed Jun. 19, 1978, Ser. No. 917,102
Int. Cl.[2] B23K *7/08*
U.S. Cl. 266—49 **17 Claims**



1. An in-line material handling system for transporting work from one station to another station comprising:

A. first and second conveyor means aligned end-to-end:

(1) the first conveyor means comprising a loading conveyor for moving the work in the direction of a processing station; and

(2) the second conveyor means comprising a supporting and off-loading conveyor for supporting the work during processing and discharging it from the processing station; and

B. a water table at said processing station, said water table comprising:

(1) a tank for holding water including upstanding side and end walls and having openings in the top of opposed end walls for permitting said second conveyor means to pass through said tank;

(2) means for sealing said openings;

(3) means for changing the water level with respect to said second conveyor means; and

(4) means on said second conveyor means for bridging said sealing means whereby when the water level in said tank is below said openings the conveyor means can be advanced through said water table.

10. An in-line material handling system for transporting work to and from a processing station comprising:

A. means for delivering work to a conveyor means;

B. conveyor means for supporting said work;

C. a water table positioned at said processing station, said water table including a tank having upstanding side and end walls and having openings in opposed end walls for permitting said conveyor means to pass through the tank;

D. means for sealing said openings; and

E. means for changing the water level with respect to said conveyor means whereby when the water level is below said opening the conveyor means can be advanced through the water table.

4,220,319

OVENS

Siegfried Rohmann, Wiesbaden, Fed. Rep. of Germany, assignor to Westofen GmbH, Wiesbaden, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,099
Claims priority, application United Kingdom, May 31, 1978, 25984/78
Int. Cl.[3] C21D *11/00*; C21C *5/42*
U.S. Cl. 266—89 **4 Claims**

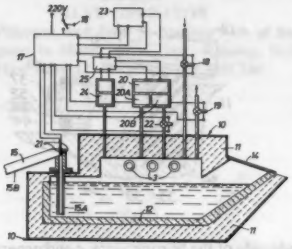
1. An apparatus for delivering predetermined metered quantities of molten metal, said apparatus comprising:

a vessel for holding molten metal, said vessel having an outlet pipe for the discharge therethrough of molten metal;

pressure means, connected to said vessel, for forcing said molten metal within said vessel to move through said outlet pipe to a discharge location therein from which said molten metal will begin to discharge;

sensing means, positioned above said discharge location, for sensing when said molten metal being moved through said outlet pipe reaches said discharge location, said sensing means comprising at least one electrode;

motorized carrier means, supporting and mounting said sensing means, for moving said sensing means to said



discharge location to sense the arrival thereat of said molten metal, and for then withdrawing said sensing means away from said discharge location to prevent said sensing means from being wetted by or immersed within said molten metal; and

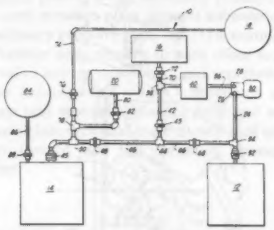
control means operatively connected to said pressure means, said sensing means and said motorized carrier means for controlling the operation thereof.

4,220,320

SILVER RECOVERY APPARATUS

John E. LeGrange, 3300 Lightner La., Oklahoma City, Okla. 73179

Division of Ser. No. 000,251, Jan. 2, 1979. This application Nov. 1, 1979, Ser. No. 90,282
Int. Cl.[3] C22B *11/04*
U.S. Cl. 266—170 **11 Claims**



1. A silver recovery apparatus, in which silver bearing source material is digested by nitric acid to form a reaction mixture for which silver(I) cyanide is thereafter precipitated by addition of cyanide solution, comprising in combination:

a digestion vessel;

a precipitation vessel;

first communication means for selectively motivating filtered fluid flow from the digestion vessel to the precipitation vessel;

a waste reservoir;

second communication means for selectively motivating fluid flow from the precipitation vessel to the waste reservoir;

a filter assembly disposed in the interior of the precipitation vessel at the terminus of the second communication means;

a cyanide solution reservoir;

third communication means for selectively motivating fluid flow from the cyanide solution reservoir to the precipitation vessel;

a source of inert pressurized gas; and

fourth communication means for selectively motivating flow of inert pressurized gas into the precipitation vessel.

4,220,321

SWIVELING MECHANISM PARTICULARLY FOR TAPHOLE PLUGGING DEVICES

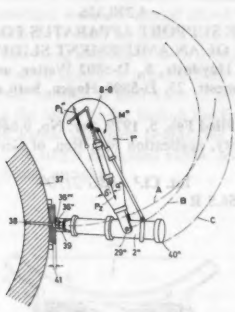
Eberhard Brücher, Siegen, Fed. Rep. of Germany, assignor to Dango & Dienenthal Maschinebau GmbH, Siegen, Fed. Rep. of Germany

Filed May 3, 1979, Ser. No. 35,773

Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822605

Int. Cl.[2] C21B *7/12*

U.S. Cl. 266—271 **7 Claims**



1. In a taphole plugging device a fixed support, an extension arm comprising a hollow casing pivotally mounted on said support, swivel drive means including a motor to swivel the extension arm and a plugging gun carried by the extension arm for sealing the tapholes of furnaces; the improvement in which the entire swivel drive means (7) is housed in said casing, the swivel drive means (7) of the extension arm (1) comprising a lever system arranged in the zone of the longitudinal plane of the extension arm, with a pivot lever (9), one end of which is rotatable about a pivot axis (14—14) fixed relative to said support, a pivot bearing (3) connected to the end of the extension arm (1) facing away from the plugging gun (2), said pivot axis (14—14) being disposed on the side facing away from the plugging gun (2) of the transverse extension arm axis (16—16) extending perpendicular to the extension arm pivot axis (8—8), the other end of said pivot lever (9) being pivotally connected to the piston rod (17) of a dual-acting swivel cylinder (11) rotatable about a swivel axis (18—18) fixed relative to the extension arm (1); said swivel drive means further comprising a guide fishplate (10) pivotally connected to the pivot lever (9), said fishplate being pivotally connected at one end to said pivot lever and at the other end being rotatable about a swivel axis (27—27) fixed relative to the extension arm (1), the pivot axes (18—18, 27—27) of the swivel cylinder (11) and the guide fishplate (10) being disposed on the side facing the plugging gun (2) of the transverse extension arm axis (16—16) at a spacing with respect to the extension arm swivel axis (8—8).

4,220,322

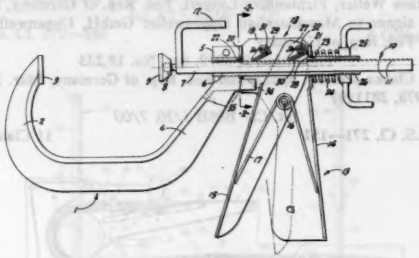
ONE-HAND OPERATED, RATCHET-ACTUATED, QUICK-SET C-CLAMP

Harold W. Hobday, 10530 Arno Rd., Galt, Calif. 95632

Filed Feb. 8, 1979, Ser. No. 10,463

Int. Cl.[3] B25B *5/02*

U.S. Cl. 269—6 **8 Claims**



1. An improved C-clamp comprising a C-shaped body having an outer leg and an inner leg, a tube secured to the free end of the inner leg and extending rearwardly therefrom, a stem slidably engaged in the tube and projecting from the front end thereof, alined work-engaging pads on the exposed front end of the stem and the outer leg of the body, a hand grip unit mounted in connection with and depending from the tube rearwardly of the body, the hand grip unit including a hand grip and a movable hand lever pivotally associated therewith, the hand lever being movable by one-hand squeezing of the hand grip unit, and means between the hand grip unit and the stem operative to step-by-step advance the stem in the tube upon recurrent manual squeezing of the hand grip unit and resultant movement of the hand lever, and means to releasably hold the stem in each advanced position thereof; the stem-advancing means including a pawl and ratchet mechanism, and the tube being formed with a longitudinal slot in the working zone of the pawl and ratchet mechanism; the stem having a row of ratchet teeth thereon normally in register with and exposed through the slot, and the pawl and ratchet mechanism including an advancing pawl extending through the slot and progressively engaging the teeth of said row thereof.

4,220,323

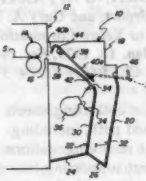
SHEET RECEIVING AND STACKING APPARATUS

John E. Smith, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 8, 1979, Ser. No. 64,924

Int. Cl.[3] B65H *29/58, 31/00*

U.S. Cl. 271—65 **11 Claims**



1. Apparatus for selectively stacking, or inverting and stacking, sheets moving seriatim along a travel path with a given facial orientation, said apparatus comprising:

means defining a sheet supporting surface for supporting and stacking sheets in a facial orientation effectively reversed from that of such sheets in the travel path; and

means selectively movable (i) to a first position along the travel path for guiding the sheets onto said supporting

surface or (ii) to a second position in the travel path for itself receiving and stacking the sheets, remote from said supporting surface, in a facial orientation the same as that of such sheets in the travel path.

4,220,324

CIRCULAR STACK SHEET FEEDING DEVICE

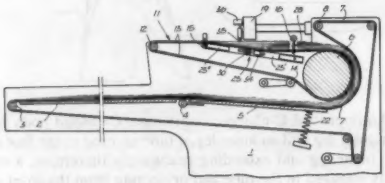
Hans Weller, Fichtenberg-Langert, Fed. Rep. of Germany, assignor to Maschinenbau Oppenweiler GmbH, Oppenweiler, Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 19,233

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811197

Int. Cl.[2] B05B *1/30, 7/00*

U.S. Cl. 271—151 **11 Claims**



1. A circular stack sheet feeding device, including:
a loading platform, which can be loaded with an imbricated sheet stack,
a means for delivering and diverting the imbricated sheet stack from the loading platform,
a means for reversing the direction of delivering the imbricated sheet stack onto a removal platform,
a conveyor means for delivering the imbricated sheet stack to the removal platform, and
individualization means for removing the top sheet of the imbricated sheet stack from the conveyor means,
comprising:
a support, divided into two sections which are pivotable relative to each other about a folding axis,
said folding axis lying transverse to the direction of movement of the conveyor means, and
said two sections being set in pivotable positions, in which the angle defined between the two sections is 180° or an upwardly open obtuse angle,
whereby a bend is not formed across the upper side of the top sheet of the imbricated sheet stack so that the top sheet of the imbricated sheet stack will thereby be reliably taken hold of by the individualization means.

4,220,325

SORTING APPARATUS

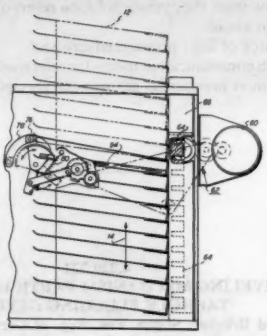
Donald W. Tates, Fairport, and Gary A. Nobles, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1979, Ser. No. 3,440

Int. Cl.[2] B65H *31/24, 31/26*

U.S. Cl. 271—293 **11 Claims**

1. An apparatus for collecting sheets arranged to advance along a pre-determined path, including:
a plurality of sheet receiving stations, each of said stations comprising a sheet supporting tray supported movably in a spaced relationship with the next adjacent tray; and
means, arranged to move from an inoperative position spaced from said plurality of sheet receiving stations to an operative position coupling one of said plurality of sheet receiving stations with the pre-determined path, for guiding a sheet advancing along the pre-determined path therealong into said one of said plurality of sheet receiving stations, said guiding means increasing the size of the entrance space of said one of said plurality of sheet receiving stations by moving an adjacent tray away from the tray at said one of said plurality of stations thereby opening said station and by depressing the sheets previously



advanced into said one of said plurality of sheet receiving stations.

4,220,326

ADJUSTABLE SUPPORT APPARATUS FOR SEGMENTS OF AN AMUSEMENT SLIDE

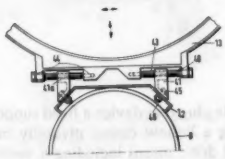
Klaus Becker, Haydnstr. 5,, D-5802 Wetter, and Dieter Behrmann, Grimmestr, 23, D-5800 Hagen, both of Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,649

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2835053

Int. Cl.[2] A63G *21/00*

U.S. Cl. 272—56.5 R **5 Claims**



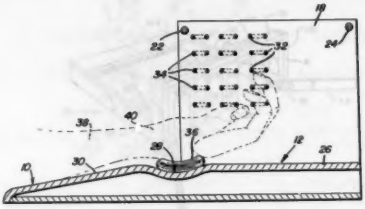
1. An adjustment apparatus for adjusting the individual segments of an amusement slide relative to the corresponding bearer support segments thereof, comprising
(a) a plurality of spaced apart supporting frames forming the support for said slide segments;
(b) a plurality of corresponding supporting bearer segments for said supporting frames; the improvement characterized by
(c) a support plate mounted on each bearer segment;
(d) each said support plate including oppositely angled inclined surfaces between said supporting frame and said bearer segment;
(e) a bearer plate positioned at each inclined surface on each said support plate and engaging the said adjacent supporting frame;
(f) each said bearer plate having a cooperating inclined surface facing the corresponding inclined surface on said support plate;
(g) means for connecting each said bearer plate to said adjacent supporting frame and support plate; and
(h) means in said connecting means allowing relative vertical and horizontal adjustment between said adjacent supporting frame and said bearer segment.

4,220,327

HAND-WRIST EXERCISER

Roger W. Herbowy, 2516 Genesee St., Utica, N.Y. 13502

Filed Oct. 17, 1978, Ser. No. 953,892
Int. Cl.[3] A63B 11/08
U.S. Cl. 272—67 8 Claims



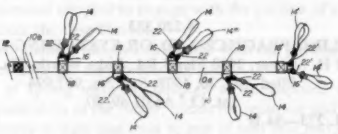
1. A hand, wrist, finger and thumb exerciser including an elongated horizontal rest having opposite side longitudinal marginal portions and front and rear ends, a pair of opposite side uprights projecting upwardly from said longitudinal marginal portions, and a plurality of elongated tensioned elastic members each extending between and anchored relative to said uprights, said tensioned elastic members including vertically spaced sets of tensioned members spaced above said rest with the tensioned members of each set spaced apart longitudinally of said rest, said rest being adapted to have the forearm and/or wrist of the user braced against its upper surface with the hand of the user disposed beneath at least some of the elastic members for gripping the latter or for flexing the fingers or hand thereagainst, said elastic members comprising longitudinally spaced sections of a single elongated elastic tension member threaded through said uprights.

4,220,328

PULLING LINE SPORT APPARATUS

Roy D. Crush, Jr., 4026 Kreinhop, Spring, Tex. 77379

Filed Jul. 12, 1978, Ser. No. 923,801
Int. Cl.[2] A63B 21/28
U.S. Cl. 272—116 13 Claims



1. Sport apparatus comprising:

an elongate, flexible, generally inelastic pulling line having opposite terminal portions and a mid-portion interconnecting said terminal portions;

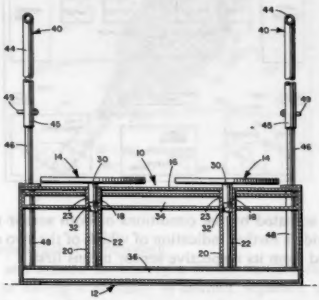
and a plurality of handle assemblies secured to each of said terminal portions respectively and longitudinally spaced thereon, each of said handle assemblies comprising at least two separate handle bodies attached to said pulling line at approximately the same location along the length thereof and both extending generally laterally outwardly from said pulling line and on generally the same side of said pulling line.

4,220,329

EXERCISER DEVICE

Ferenc I. Agyagos, Sangin Building, 3-21-5 Akasaka, Minato-ku, Tokyo, Japan

Filed Nov. 6, 1978, Ser. No. 957,843
Claims priority, application Japan, Dec. 16, 1977, 52/169248; Dec. 16, 1978, 52/169249; Feb. 3, 1978, 53/003741; Feb. 3, 1978, 53/003742; Feb. 3, 1978, 53/013247
Int. Cl.[2] A63B 21/00
U.S. Cl. 272—146 8 Claims



1. An exerciser device for exercising the body or a user comprising: a raised supporting base member; two spaced horizontally and freely rotatable removable platforms, each said platform being rotatable either clockwise or counterclockwise independent of the other and each having a fixed vertical downwardly extending turning shaft; two spaced parallel socket means positioned in the top of said base member, each socket means adapted to removably receive one of said turning shafts when positioned in said socket means and to retain the platforms spaced above the top of said base member to provide a pair of horizontally-positioned spaced platforms independently rotatable with respect to each other and to said base by motion of the body of the user; and a parallel pair of hand gripping support bars attached to and extending upward from said base, one on each side of said pair of independently rotatable platforms.

4,220,330

ARM WRESTLING REFEREE DEVICE

Theophalus S. Montgomery, 2710 West Ogden, Apt. 405, Chicago, Ill. 60608

Continuation-in-part of Ser. No. 765,965, Feb. 7, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,934
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—1 E 21 Claims

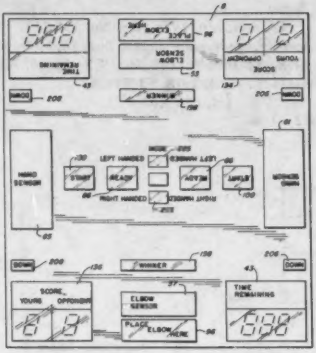
1. Apparatus for facilitating and refereeing an arm wrestling match between a plurality of participants comprising:

a housing defining a playing surface for at least two participants;

two sensor means spaced apart in said housing each including an elbow supporting surface supported by said housing to accommodate the elbows of two participants whereby said sensor means sense the presence of at least one player's elbow on said elbow supporting surface;

electrical switch means, indicator means and circuit means for each of said sensor means, said switch means being actuated by said sensor means and disposed within said housing, said indicator means suitably located in said housing, and said circuit means operatively interconnecting said switch means, said indicator means, and means for supplying power, whereby the presence of an elbow on

said sensor means actuates said switch means to cause said indicator to provide a discernible indication thereof; and



means actuated by the conditions of both sensor means to provide a further indication of which of the two elbows is raised from its respective sensor means first.

4,220,331

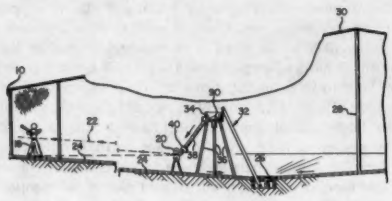
BASEBALL BATTING RANGE RETRIEVAL SYSTEM

Tommy L. Smith, Rte. 3, Box 590, Aurora, Oreg. 97002

Filed Apr. 5, 1979, Ser. No. 27,290

Int. Cl.[2] A63B *69/40*

U.S. Cl. 273—26 D **8 Claims**



1. In a baseball batting range including a plurality of batting stations and a plurality of pitching machines located forward of and in spaced relation to corresponding batting stations for pitching balls theretoward, a ball retrieval system comprising:

a sump located forwardly of said batting stations, the floor of said baseball batting range being sloped toward said sump so that batted balls roll toward and are collected in said sump,

a ball distribution hopper supported at a location elevated with respect to said sump,

a conveyor extending between said sump and said ball distribution hopper for receiving balls from said sump and delivering the same to said distribution hopper, said sump being provided with first agitation means for bringing about substantially cntinuous movement of said balls in said sump and delivery of the same to said conveyor,

a separate gravity feed means associated with each of said pitching machines and adapted to receive a plurality of baseballs for delivery to the corresponding pitching machine whereby a pitching machine will successively pitch the balls received from a gravity feed means, each of said separate gravity feed means being connected to said ball distribution hopper to receive balls therefrom, and second agitation means in said ball distribution hopper for providing substantialy continuous movement of the balls in said distribution hopper for substantially continuous delivery thereof to the said separate gravity feed means associated with said pitching machines.

4,220,332

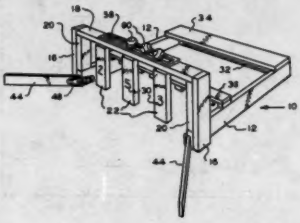
BOWLING GAME

Guadalupe C. Mendez, 400 College Ave., Apt. 1207, Adrian, Mich. 49221

Filed Sep. 8, 1978, Ser. No. 940,732

Int. Cl.[3] A63D *3/00*

U.S. Cl. 273—41 **4 Claims**



1. A bowling game comprising, in combination, a frame adapted to be supported upon a floor including a pair of spaced side members interconnected by a base member, said members defining a generally U-shaped configuration, said side members each including a front end and a rear end, said base member being affixed to said side members at said rear ends thereof, a wing member mounted upon each of said side member front ends extending forwardly and obliquely relative to the associated side member to define a ball guide, a hinge interconnecting said wing members to the associated side member front end, said wing members being pivoted between the extended forward and oblique position and a retracted position adjacent the associated side member, a retractable lock means defined on said side members selectively holding the associated wing member in the retracted position, a bridge member attached to said side member front ends vertically extending above and interconnecting said front ends, at least one target pivotally attached to said bridge member and depending therefrom a sufficient extent to permit being struck by a ball rolling on the floor under said bridge member, and unidirectional ball retaining means mounted on said side members intermediate said target and base member permitting balls rolled at said target to pass therethrough and preventing balls from passing therethrough in the opposite direction toward said target and side members front ends, said ball retaining means comprising a support member mounted on said side members and extending thereabove, a plurality of hinged members individually pivotally mounted on said support member and extending therebelow and stop limit means defined on said support member controlling the extent of pivoting of said each of hinged members.

4,220,333

BOWLING PRACTICE AND/OR EXERCISING DEVICE

Ronald H. Mercer, 2900 Floral Rd., Lake Worth, Fla. 33462

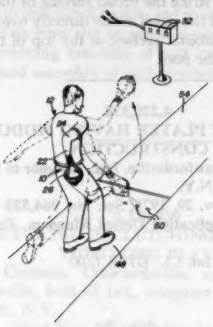
Filed Aug. 30, 1978, Ser. No. 937,994

Int. Cl.[2] A63B *69/00*

U.S. Cl. 273—54 B **5 Claims**

1. A bowling practice and/or exercising device comprising a retainer for receiving a bowling ball and means securing the retainer to the wrist area of a user to enable the bowling ball in the retainer to be swung in an arcuate path simulative of actually delivering a bowling ball with the retainer retaining the bowling ball adjacent the hand of the user throughout the delivery wherein the outer end of the retainer includes light means for projecting a light beam axially outwardly therefrom, a plurality of transversely spaced light sensing means positioned in the approach path of a user to be energized by the light beam emitted from the light means during the practice delivery of the bowling ball, an indicator means generally at eye level of the user to enable the user to observe which of the light sensing means was energized for indicating the "spot" on

the bowling alley over which the ball would have passed had the ball actually been released onto the bowling alley, enabling



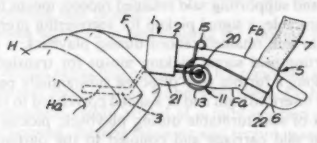
the user to practice and/or exercise various aspects of bowling without requiring the use of a bowling alley.

4,220,334

SEPARABLE TYPE ELASTIC FINGER REHABILITATION DEVICE

Sakumi Kanamoto, Osaka; Hiroshi Ogisawa, Takatsukishi, and Akio Ishida, Osaka, all of Japan, assignors to Maruho Co., Ltd., Osaka, Japan

Filed Jun. 22, 1978, Ser. No. 917,887
Claims priority, application Japan, Jun. 27, 1977, 52-85873[U]
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—67 **12 Claims**



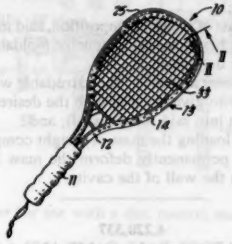
1. A separable type finger rehabilitation device comprising:
a first member adapted to engage with the portion of a finger adjacent the base thereof;
a second member adapted to engage with the portion of the finger adjacent the tip thereof; and
a pair of spring members adapted to be disposed on the opposite sides of the finger, means for securing said spring members at their one ends to one of said first and second members and for detachably connecting their other ends to the other of said members, each said spring member being a spiral spring and formed to provide a force to resiliently oppose the bending action of the finger to which the device is attached, with the force increasing as the finger is bent further, said securing means further comprising each said spiral spring having a first extension extending in one direction from the outer end of said spiral spring portion and being fixedly connected to said second member and a second extension extending in the opposite direction from the inner end of said spiral spring portion and having a connecting end adapted to be detachably connected to said first member.

4,220,335

GAMES RACKETS

John W. Nobbs, Ewhurst, England, assignor to Alloway Trust Limited, Douglas, Isle of Man

Filed Dec. 26, 1978, Ser. No. 972,719
Claims priority, application United Kingdom, Dec. 31, 1977, 54404/77; May 31, 1978, 25549/78
Int. Cl.³ A63B *51/12*
U.S. Cl. 273—73 R **18 Claims**



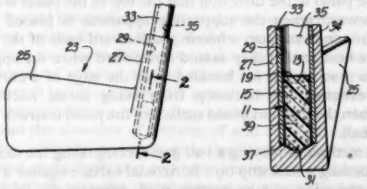
1. A games racket comprising
a shaft and a head formed by a frame section, said frame section having a plurality of distinct, separate, generally radially extending aperture means for receiving strings of the racket therein; and said frame section having an outer face; and
protective bumper strip means for providing surface to surface contact with said frame section over a portion thereof so that said means acts as a protective bumper for said frame section, said bumper strip means comprising an inner face which conforms generally to the shape of at least a substantial part of the width of the outer face of said frame section, and including a plurality of generally radially extending, distinct, separate apertures therein aligned with said aperture means in said frame section for receipt of racket strings therein.

4,220,336

EXTRUDABLE WEIGHT CAPSULE

Rudolph J. Kochevar, 252 Arbolada Dr., Arcadia, Calif. 91006

Filed Feb. 27, 1978, Ser. No. 881,146
Int. Cl.³ A63B *53/02*
U.S. Cl. 273—80.8 **22 Claims**



10. A weighted article comprising:
a member having an internal wall defining a cavity;
a mass of permanently deformable weight composition of predetermined weight in said cavity to add weight to said member,
said mass of weight composition being deformed into intimate contact with the internal wall;
said mass of permanently deformable weight composition including particulate metal and a binder for holding the particulate metal together, said particulate metal being present in the mass of weight composition in an amount equal to at least about 90 percent by weight of the mass of weight composition; and

said member being a golf club and including a head and a tubular shaft, said head including a tubular section having a passage terminating in said head and receiving an end portion of the tubular shaft, said cavity being in said passage of said tubular section.

20. A method of weighting a golf club comprising:

providing a golf club including a head and a tubular shaft, said head including a passage for receiving an end portion of said tubular shaft, said golf club having a cavity in said head with at least a portion of the cavity being withing said passage;

providing a mass of weight composition, said mass of weight composition being readily manually moldable and being permanently deformable;

placing a sufficient amount of the extrudable weight capsule in the cavity to give the golf club the desired weight;

inserting a ram into said tubular shaft; and

compressively loading the mass of weight composition with said ram to permanently deform the mass into intimate contact with the wall of the cavity.

4,220,337

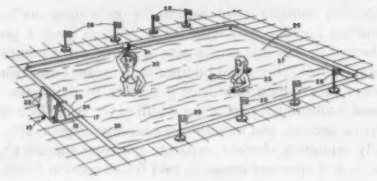
SWIMMING POOL BALL GAME AND A TILTED BACKSTOP FOR USE IN THE GAME

Robert E. Moore, 8637 Maryford Dr., San Diego, Calif. 92119

Filed Jan. 17, 1979, Ser. No. 4,068

Int. Cl.[2] A63B *63/00, 71/00*

U.S. Cl. 273—395 **10 Claims**



1. A backstop, comprising

a broad panel for rebounding a thrown ball;

supporting apparatus for supporting the panel for rebounding said ball, wherein the panel is supported in a position that is tilted from the vertical when the supporting apparatus is placed upon a horizontal surface;

characterized by

the supporting apparatus including

a plurality of rods extending horizontally from the bottom of the panel in the direction that the top of the panel is tilted forward when the supporting apparatus is placed on a horizontal surface, wherein the forward ends of the rods are bent so that they extend downward when the apparatus is so placed for hooking over the edge of a curb for preventing the backstop from being thrust backward when the forward broad surface of the panel is struck with a ball.

5. A method of playing a ball game, comprising the steps of

positioning a backstop on a horizontal surface against a curb at the edge of a swimming pool, wherein the backstop comprises a broad panel for rebounding a thrown ball, and a supporting apparatus for supporting the panel for rebounding said ball, wherein the panel is supported in a position in which the top of the panel is tilted forward from the vertical toward said pool when the supporting apparatus is positioned on said horizontal surface, and wherein the supporting apparatus includes a plurality of rods extending horizontally from the bottom of the panel in the direction toward said pool when the supporting apparatus is positioned on said horizontal surface, wherein the forward ends of the rods are bent so that they extend downward and are hooked over the edge of said curb for preventing the backstop from being thrust backward when the forward broad surface of the panel is struck with a ball; and

throwing a ball to strike the broad surface of the panel so as to rebound from the panel either directly toward the pool or onto the horizontal surface at the top of the curb and thence toward the pool.

4,220,338

VIDEO DISC PLAYER HAVING MODULAR CONSTRUCTION

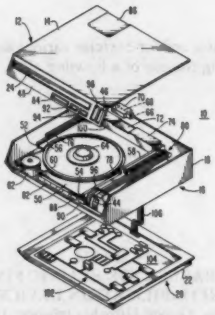
Clyde F. Coleman, Crawfordsville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,533

Claims priority, application United Kingdom, Feb. 13, 1978, 05731/78

Int. Cl.[3] G11B *1/00*

U.S. Cl. 274—2 **7 Claims**



1. In a player for use with a disc record subject to removable occupancy of a protective caddy; said player including means for extracting said record from said caddy when said caddy is withdrawn from said player after a full insertion of an occupied caddy into said player along a path, whereby said extracted record is retained in said player for playback; a turntable for centering and supporting said retained record; means for rotating said turntable; a signal pickup for recovering prerecorded signals from said retained record during playback; a carriage for supporting said signal pickup; means for translating said carriage along a further path disposed substantially parallel to said caddy insertion path and at a speed correlated to the speed of rotation of said turntable during playback; pickup circuits disposed in said carriage and coupled to the output of said signal pickup for developing at the output thereof a signal representative of said prerecorded signals on said record; signal processing circuits coupled to said output of said pickup circuits for developing a signal suitable for application to a television receiver; and controls for operating said player; apparatus including:

(A) a separable cover member having a top wall;

(B) a separable trough member having perimetrical side walls; said trough member including means for rotatably supporting said turntable; wherein means are provided for mounting said turntable rotating means to said trough member; said trough member having means for guiding said carriage along said further path; wherein means are provided for securing said carriage translating means to said trough member; said trough member being equipped with means for mounting said operating controls; and

(C) a separable base member having a bottom wall; said base member including means for securing said signal processing circuits thereto;

wherein said cover member, said trough member and said base member are subject to assembly in which said top wall of said cover member, said perimetrical side walls of said trough member and said bottom wall of said base

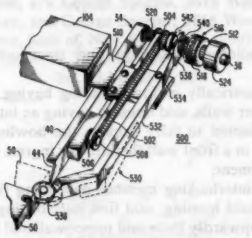
member, respectively, for the top wall, the side walls and the bottom wall of the player assembly; wherein said cover member has openings for respectively providing access to said signal pickup and to said operating controls, and has an input slot arranged in said caddy insertion path for permitting insertion of said caddy into said player, when said assembly of said members is formed.

4,220,339

CADDY-ACTUATED DECLUTCHING MECHANISM FOR VIDEO DISC PLAYER

Clyde F. Coleman, Crawfordsville, and Nicki L. Farley, McCordsville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,643
Int. Cl.³ G11B *25/04*
U.S. Cl. 274—9 B **3 Claims**



1. A player for use with a record caddy; said player comprising:

(A) a housing having an input slot into which a caddy is inserted along a path;

(B) a turntable mounted in said housing for centering and supporting said record;

(C) means mounted in said housing for rotating said turntable;

(D) a record extracting mechanism for removing said record from said caddy during withdrawal thereof subsequent to an occupied caddy arrival at a fully inserted position in said housing, thereby retaining said record in said housing;

(E) a signal pickup for recovering prerecorded information from a turntable-supported record during playback;

(F) a carriage for supporting said signal pickup

(G) means for guiding said carriage in said housing along a second path lying substantially parallel to said path of caddy insertion; the location of said carriage path relative to said caddy path being such that said caddy engages said carriage during a caddy insertion into said housing;

(H) carriage translating means secured to said carriage;

(I) means for utilizing said carriage translating means during playback for translating said carriage along said guiding means in correlation with the rotation of said turntable and away from a starting position in a direction opposite to the direction of said caddy insertion; said utilizing means including coupling means interposed between said carriage translating means and a carriage drive means; and

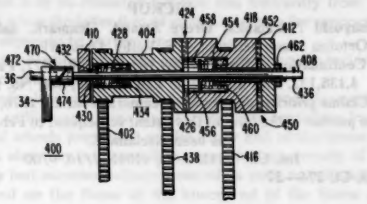
(J) means, responsive to a caddy insertion into said player, for rendering said coupling means disabled, whereby return of said carriage to said starting position can be effected, with freedom from interference by said carriage drive means, when said carriage is at a position other than at said starting position during such a caddy insertion.

4,220,340

CONSTANT DRAG CARRIAGE TRANSLATING MECHANISM FOR VIDEO DISC PLAYER

Leslie A. Torrington, and Larry D. Huff, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,527
Int. Cl.³ G11B *25/04*
U.S. Cl. 274—13 R **11 Claims**



1. A player for use with a disc record; said player comprising:

(A) a housing into which a record is inserted;

(B) a turntable for supporting and centering said record;

(C) means for rotating said turntable;

(D) a signal pickup for recovering prerecorded information from a turntable-supported record during playback;

(E) a carriage for supporting said signal pickup;

(F) means for guiding said carriage in said housing along a path;

(G) common carriage translating means including a drive belt secured to said carriage and disposed about an idler pulley and a carriage driving pulley such that said drive belt extends parallel to said carriage path; the rotation of said carriage driving pulley in a forward direction and a reverse direction respectively causing motion of said carriage toward and away from the center of said turntable;

(H) first means for utilizing said common carriage translating means for translating said carriage during playback toward said turntable center at a speed correlated to the speed of rotation of said turntable; said first utilizing means including (a) a turntable-driven pulley mounted coaxially with said carriage driving pulley, said turntable-driven pulley being capable of rotation in a forward and a reverse direction, (b) means coupled to said turntable rotating means for rotating said turntable-driven pulley in said forward direction, and (c) slip clutch means interposed between said carriage driving pulley and said turntable-driven pulley;

(I) second means for utilizing said common carriage translating means for translating said carriage toward and away from said turntable center at a speed independent of the speed of rotation of said turntable; said second utilizing means including manually actuated means coupled to said carriage driving pulley for variably controlling the speed and the direction of rotation of said carriage driving pulley, whereby said carriage is translated selectively toward and away from said turntable center at a variable speed; wherein said slip clutch means interposed between said carriage driving pulley and said turntable-driven pulley permits wresting of control of said carriage driving pulley from said turntable-driven pulley by said manually actuated means upon operation thereof;

(J) a member mounted to said housing, independent of said means for rotating said turntable-driven pulley, providing a surface for contacting said turntable-driven pulley; and

(K) means for urging engagement between said contacting surface of said member and an engaging surface of said turntable-driven pulley to provide a drag force of a given magnitude; said magnitude of said drag force being such as to deter rotation of said turntable-driven pulley in said reverse direction during rotation of said carriage driving

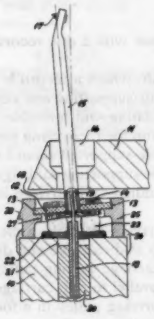
pulley in said reverse direction effected by operation of said manually actuated means, whereby translation of said carriage by said first utilizing means toward said turntable center is resumed upon cessation of operation of said manually actuated means without delay due to effects of backlash in said first utilizing means.

4,220,341

PICKUP

Hisayoshi Nakatsuka, Greve Strand, Denmark, assignor to Ortofon Manufacturing A/S, Valby, Denmark

Continuation of Ser. No. 808,163, Jun. 20, 1977, Pat. No. 4,138,122. This application Feb. 2, 1979, Ser. No. 9,176
Claims priority, application Denmark, Jun. 22, 1976, 2802/76
The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.
Int. Cl.[3] G11B *3/46*; H04R *1/16, 9/00*
U.S. Cl. 274—37 **6 Claims**



1. A pickup comprising:
magnetic flux conducting means for conducting magnetic flux and being discontinuous so as to form an air gap therein;
a moving system including a stylus arm and an armature;
pivoting means for pivotally mounting said moving system in said air gap, said pivoting means providing a pivot point about which said moving system can oscillate in all directions;
said pivoting means including:
first resilient bearing means, spaced a first distance from said pivot point, for supporting said armature, and
second resilient bearing means, spaced a second distance from said pivot point, for engaging said moving system with a lower pressure than said first resilient bearing means, said second distance being greater than said first distance.

4,220,342

GASKET HAVING POLYSILOXANE SEALANT LAYER CONTAINING ORGANOTITANATE

Kanu G. Shah, Arlington Heights, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed May 29, 1979, Ser. No. 43,049
Int. Cl.[3] F16J *15/12*
U.S. Cl. 277—228 **26 Claims**

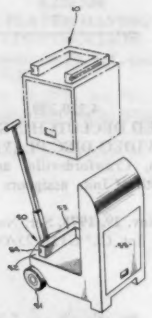
1. A gasket comprising a base sheet and a sealant layer strongly adhered thereto having increased resistance to delamination, said sealant layer comprising a polymerized, solid organopolysiloxane having an organotitanate dispersed substantially throughout said organopolysiloxane, said organotitanate serving to retard the rate of polymerization of said organopolysiloxane to said solid state to provide a longer pot life and to couple said organopolysiloxane to said base sheet and provide said strong adherence.

4,220,343

BOWLING BALL STORAGE AND TRANSPORTATION APPARATUS

Charles H. Robinson, 1066 Thompson, Glendale, Calif. 91201

Division of Ser. No. 826,367, Aug. 23, 1977, Pat. No. 4,166,530.
This application Apr. 10, 1978, Ser. No. 894,988
Int. Cl.[2] A45C *5/14*
U.S. Cl. 280—33.99 T **6 Claims**



1. A bowling ball storage and transporting apparatus comprising:
(a) a geometrically uniform housing having parallel upper and lower walls, said housing having an interior compartment adapted to fully enclose the bowling ball and an opening in a front wall therefor for ingress to said interior compartment;
(b) a first interlocking member depending from the upper wall of said housing, said first interlocking member projecting upwardly from said upper wall and having at least three contiguous vertical surfaces perpendicular thereto;
(c) a second interlocking member depending from the bottom wall of said housing, said second interlocking member being adapted to engage said first interlocking member whereby said first and second interlocking members are laterally coupled to one another;
(d) a covering member having first and second side flanges pivotally coupled within the interior compartment of said housing, a first curved section disposed intermediate said first and second side flanges, said curved section tangentially depending into a lower front wall for said housing and including a shim affixed to the inside of said covering member within the interior compartment of said housing, said shim having a concave profile substantially the same as the bowling ball and adapted to be urged against the midline of the bowling ball; and
(e) a wheeled platform having an interlocking member depending from said platform adapted to be engaged with the second interlocking member of a housing.

4,220,344

LAWN MOWER WITH VERTICALLY ADJUSTABLE WHEELS

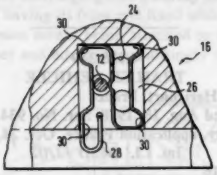
Friedrich Kappel, Scheuerfeld, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany

Filed Apr. 26, 1978, Ser. No. 900,082
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 7713614[U]
Int. Cl.[2] B62D *65/00*
U.S. Cl. 280—43 **22 Claims**

1. An adjustable position axle support, comprising:
an axle for supporting a wheel; detent spring leg receiving means formed in said axle;
a chassis by which said axle is to be received; said chassis including a wall; said wall having and defining a plurality of mounting holes therein, each for receiving said axle and

for positioning said axle at a different position with respect to said chassis;

detent spring means comprising a resilient strip in the form of a spring leg; said spring means leg being supported by



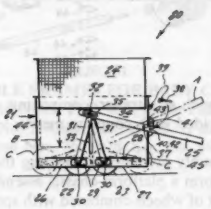
and engaging said chassis and being normally resiliently self biased toward and defining an engaging detent connection with said receiving means for holding said axle in said mounting hole.

4,220,345

PICNIC BASKET ON ROLLERS

Clarine Johnson, c/o George Spectro, 3615 Woolworth Bldg, 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Nov. 23, 1976, Ser. No. 744,248
Int. Cl.[2] B62B *3/02*
U.S. Cl. 280—43.16 **1 Claim**



1. A cart having front and rear axles supporting a cart frame, including front and rear wheels mounted on the ends of said axles, including a basket vertically movable mounted in said frame including a rearward extending handle pivotably mounted on said frame, said handle including a forward end engaging said basket for elevating said basket upon pivotal motion of said handle, said axles being slidably mounted on said frame including a second means for moving said axles relative to each other responsive to and coacting with actuation of said forward end of said handle wherein said forward end of said handle engages, the basket bottom and wherein the second said means comprises blocks secured to said axles mounted movably in channels formed on opposite sides of said frame, said forward end and said blocks being pivotably connected to members forming part of said second means whereby vertical movement said handle causes simultaneous movement of the basket and axles.

4,220,346

UTILITY CART

Robert C. Geschwender, Lincoln, Nebr., assignor to Concept Engineering Inc., Lincoln, Nebr.

Filed Sep. 26, 1978, Ser. No. 945,858
Int. Cl.[2] B62B *1/04*
U.S. Cl. 280—47.18 **30 Claims**

1. A utility cart comprising: an upwardly extending frame;

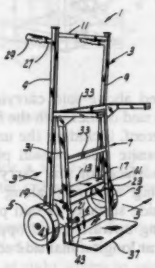
a pair of wheels journaled on the lower end of the frame at opposite sides of the frame for rotation about an axis extending transversely of the frame;

a bed pivoted adjacent one of its ends on the frame at the lower end of the frame for swinging about an axis generally parallel to the axis of rotation of the wheels between an extended position in which the bed extends generally perpendicularly from the frame in a generally horizontal direction constituting the forward direction, and an upright position in which the bed extends upwardly alongside the frame; support means at said one end of the bed adapted to extend downwardly from the bed when the latter is in its extended position and forwardly from the bed when the latter is in its upright position for supporting an object to be carried on the cart;

legs at the other end of the bed for supporting the bed in its extended position; and

means for locking the bed to the frame in its upright position.

21. A utility cart comprising an upwardly extending frame, a pair of wheels journalled on the lower end of the frame for rotation about an axis extending generally transversely of the frame, a bed mounted adjacent one of its ends constituting its inner end on the frame at the lower end of the frame and



extending generally perpendicularly outwardly from the frame, tubular legs at the outer end of the bed for supporting the bed, an upright removable attached to the bed at the outer end of the bed and extending upwardly from the bed generally parallel to the frame, said frame comprising a pair of spaced-apart side frame members connected by a cross frame member spaced below but adjacent to the upper ends of the side frame members, said upright comprising a pair of parallel posts extending upwardly from the bed and connected by a crosspiece spaced below but adjacent to the upper ends of said posts, the cross frame member of the frame and the crosspiece of the upright being spaced approximately the same distance above the bed, and a shelf adapted to extend between the frame and the upright and to rest on said cross frame member and crosspiece generally parallel to the bed, said shelf being liftably removable from the cart and formed for interfitting with the frame and upright thereby to maintain it in place on the cart, said legs being open at their upper ends thereby constituting sockets for receiving therein the lower ends of the posts of the upright removably to attach the upright to the bed.

4,220,347

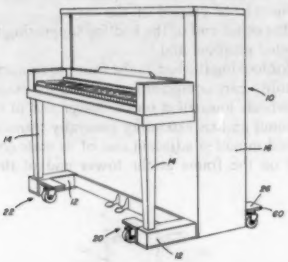
SAFETY PIANO DOLLY

Gordon T. Huntington, 4121 W. 13400 South, Riverton, Utah 84065

Filed Dec. 20, 1978, Ser. No. 971,421
Int. Cl.[3] B62D *21/12*
U.S. Cl. 280—79.1 A **4 Claims**

1. In combination with a transversely elongated upright piano of the type including front and rear facing sides and forwardly projecting lower opposite side support arms to which the lower ends of front opposite side vertical support legs are anchored, a pair of dollies for underlying and supporting opposite sides of said piano, each of said dollies including an elongated front to rear extending carrying arm defining inner and outer side marginal edge portions and front and rear end edges portions, a front upright arm anchored relative to

and projecting upwardly from the forward end portion of said inner side marginal portion and terminating upwardly in a horizontal support plate projecting outwardly of said inner side marginal edge portion, a rear upright arm anchored relative to and projecting upwardly from the rear edge portion and terminating upwardly in a horizontal rearwardly directed support plate, and a pair of front and rear casters supported from said support plate in underslung relation thereto, said casters including support wheels journaled for rotation about



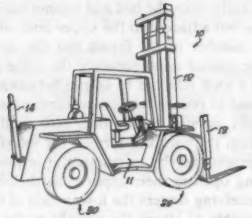
horizontal axes spaced above said carrying arm, said piano being supported from said dollies with the front to rear extending undersurfaces thereof, including the undersurfaces of said support arms, at opposite sides of said piano overlying and opposing the upper surfaces of said carrying arms, said rear upright arms extending upwardly along and opposing the adjacent rear facing side surfaces of said piano and said front upright arms extending upwardly and opposing forward end portions of the adjacent longitudinal side edges of said support arms.

4,220,348

CENTER PIVOT STEERING MECHANISM

Leonard J. Low, P.O. Box 1927, Sparks, Nev. 89431

Filed Aug. 30, 1978, Ser. No. 938,086
Int. Cl.[2] B62D *5/08*
U.S. Cl. 280—95 R **3 Claims**



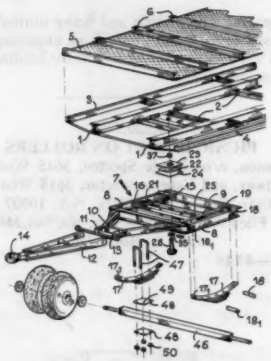
1. The combination with the steering axle of a lift truck of (1) A first wheel pivotally mounted at the first end of said axle; (2) A second wheel pivotally mounted at the second end of said axle; (3) A pivot arm comprising a pair of parallel plates, one of which parallel plates passes over and the other of which parallel plates passes under the said axle, and wherein which said parallel plates have mounting means for mounting upon a pivotal mounting means attached to said axle wherein the pivotal mounting means includes a pivot pin and a bearing; (4) An elongated arm connected adjacent one end to said pair of parallel plates at an essentially 90 degree relationship to the planes in which said plates lie; (5) Means fastening said elongated arm at its end opposite from the end adjacent the said pair of plates to means capable of activating said elongated arm in such manner as to cause the pair of plates to pivot in their pivotal pounting; (6) First elongated connecting means having two ends, fastened at one of its ends to the pivotal mounting of the first wheel and fastened at its other end to the pivot arm pivotally mounted upon the said axle; and (7) Second elongated connecting means having two ends, fastened at one of its ends to the pivotal mounting of the second wheel and fastened at its other end to the pivot arm, pivotally mounted to the said axle.

4,220,349

TRAILER VEHICLE

Henri Gaussin, Hericourt, France

Filed Aug. 18, 1978, Ser. No. 934,865
Claims priority, application France, Oct. 24, 1977, 77 31885
Int. Cl.[2] B62D *13/02*
U.S. Cl. 280—116 **7 Claims**



1. A vehicle such as a trailer, comprising
a chassis provided with coupling means;
a platform;
a pivotal assembly pivotally connecting the platform to the chassis to form a platform-chassis assembly;
at least one set of wheels combined with spring means carrying said platform-chassis assembly;
said chassis being angularly movable relative to the platform;
said pivotal assembly being self-lubricating and including two metal plates rigidly mounted on the platform and the chassis, respectively, a wear plate which is interposed between the two metal plates, said two metal plates and said wear plate each having an orifice, and a pivot extending through the orifices of the three plates and pivotally interconnecting the platform and the chassis,
said platform and said chassis each including a U-section stiffening member on which the respective metal plate is fixedly mounted, and
each stiffening member extending across the respective metal plate and provided with an orifice in axial alignment with the orifices formed in the metal plates for receiving the pivot.

4,220,350

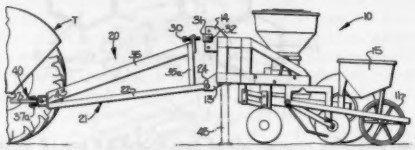
TONGUE FOR CONNECTING A DRAFT IMPLEMENT TO A TOWING VEHICLE

John C. Hatcher, Charlotte, N.C., assignor to Cole Manufacturing Company, Charlotte, N.C.

Filed Jan. 8, 1979, Ser. No. 1,734
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—656 **7 Claims**

1. A tongue for connecting a draft implement to a towing vehicle, said tongue comprising an elongate frame having a front end portion adapted to be detachably connected to the rear portion of a towing vehicle and a rear end portion adapted to be pivotally connected to a lower front portion of the draft

implement for movement about a substantially horizontal lateral axis, and abutment means fixedly supported by said frame and being positioned above said rear end portion of said frame, said abutment means being joined with said frame by an elongate frame member converging downwardly and with respect to said frame and having its front end fixed with respect to said frame, said abutment means being attached to the rear end of said frame member and adapted to abuttingly engage a corresponding upper front portion of the draft implement for limiting pivotal upward movement of said tongue relative to the draft implement and for permitting said abutment means to swing forwardly away from said upper front portion of the draft implement in accommodation of pivotal downward movement of said tongue relative to the draft implement incidental to downward movement of the towing vehicle relative to the draft implement.



4,220,351

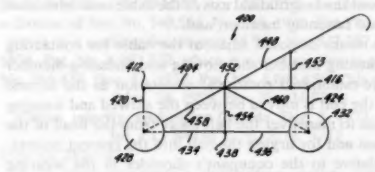
COLLAPSIBLE FRAMES FOR BABY CARRIERS

Henry Fleischer, 18 Notch Park Rd., Little Falls, N.J. 07424

Division of Ser. No. 759,081, Jan. 13, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,976

Int. Cl.[2] B62B *7/08*

U.S. Cl. 280—647 **6 Claims**



1. A collapsible frame comprising, in combination, a pair of side support members, a pair of end support members connected to said side support members to form four corners, front and back legs, one of said legs being pivotally connected to and extending downwardly from each of said corners, one or more wheels connected to lower ends of each of said legs, a pair of wheel side braces, disposed in close proximity to each of said side support members, upper end portions of each pair of said wheel side braces being pivotally connected to each other to define a side pivot point, and lower end portions of each pair of wheel side braces being connected to a pair of front and back legs, a pair of handle support members, each one of which is connected to a side pivot point, and a pair of handle struts each connected to and between a handle support member and a side support member, whereby upon applying a downward force on said handle support members, said side pivot points are lifted causing each of said pair of wheel side braces to be lifted thereby causing the front legs and back legs and wheels carried thereby to be lifted upwardly so that said front and back legs move toward each other to a collapsed position.

4,220,352

SUSPENSION FOR A FRONT AXLE OF A TRAILER

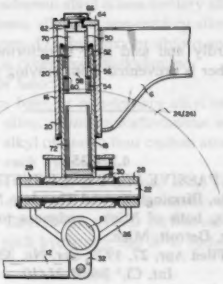
Haruhiko Umeda, Yokohama; Masaru Uenoyama, Ayase; Kotoshige Ishizuki, Yokohama; Hiroyuki Ando, and Naotaka Endo, both of Kawasaki, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,061

Claims priority, application Japan, Oct. 13, 1977, 52-136261[U]; Oct. 13, 1977, 52-136262[U]

Int. Cl.[2] B06G *13/00*

U.S. Cl. 280—708 **4 Claims**



3. A suspension for a front axle of a trailer comprising a trailer frame; an outer cylindrical member fixedly secured to said trailer frame;

bracket means mounted on said front axle;

shaft means mounted on said bracket means, said shaft means being arranged at right angles to said front axle;

a sleeve rotatably mounted on said shaft means;

an intermediate cylindrical member fixedly secured to said sleeve and adapted to slide within said outer cylindrical member;

an inner cylindrical member suspended from said outer cylindrical member and adapted to slide within said intermediate cylindrical member, said inner cylindrical member having fluid and compressed gaseous medium contained therein;

a first bushing inwardly mounted on said intermediate cylinder;

a second bushing outwardly mounted on said inner cylindrical member defining a cylindrical chamber between said first and second bushings; and

means for communicating said cylindrical chamber with the fluid contained in said inner cylindrical member.

4,220,353

SUPPORTING DEVICE FOR SEAT BELT

Naozane Maekawa, Toyokawa, and Takeshi Awano, Okazaki, both of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1979, Ser. No. 10,377

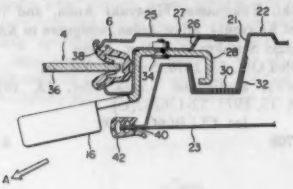
Claims priority, application Japan, Feb. 16, 1978, 53-18730[U]; Jun. 7, 1978, 53-78317[U]

Int. Cl.[3] B60R *21/10*

U.S. Cl. 280—801 **13 Claims**

1. A supporting device for a seat belt, comprising a seat belt support member for supporting the seat belt attached to a rearward portion of a sash of a door of a vehicle, a forward edge of said door being pivotally supported by a body of the vehicle, a striker provided on the sash in the vicinity of a connection between the support member and the sash and projecting in a direction of the width of the vehicle, and a recess provided on a pillar of the vehicle body adjacent to a rearward edge of said door and defined by a wall projecting into the inside space of the pillar, said striker entering into said

recess when said door is closed, said striker being detained by said wall defining said recess when said seat belt is strongly



pulled forwardly and said sash is deformed, whereby said support member is prevented from moving forwardly.

4,220,354

PASSIVE SEAT BELT SYSTEM

Roy S. Cataldo, Birmingham, and Theodore M. Salamon, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 27, 1979, Ser. No. 33,759

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—803 **2 Claims**

1. In combination with a vehicle body having a door movable between open and closed positions laterally adjacent a seat mounted within an occupant compartment of the vehicle body, a passive belt arrangement for restraining a seated occupant comprising:

an inboard seat belt retractor mounted inboard the occupant seat;

a first restraint belt having an inboard end retractably mounted by the inboard retractor and an outboard end attached to the vehicle door so that the first restraint belt is extended from the inboard retractor to an occupant access position when the door is opened and retracted to a restraining position about the occupant when the door is closed;

a second restraint belt having an outboard end retractably mounted on the vehicle door and an inboard end;

a first buckle component mounted on the vehicle body inboard the occupant seat and generally adjacent the inboard retractor;

a second buckle component mounted on the first restraint belt for sliding movement therealong and having the inboard end of the second restraint belt attached thereto so that the second buckle component is carried with the first restraint belt during extension and retraction from the inboard retractor upon door movement and is movable by occupant effort along the first restraint belt to effect latching engagement of the second buckle component with the first buckle component to establish the second restraint belt in a restraining position.

4,220,355

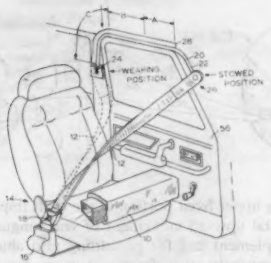
CAM GUIDE FOR PASSIVE SHOULDER HARNESS

Cyril Henderson, Encino; William Hollowell, Pacific Palisades, and Albert R. Close, Newhall, all of Calif., assignors to American Safety Equipment Corporation, San Fernando, Calif.

Filed Aug. 24, 1978, Ser. No. 936,209

Int. Cl.² B60R *21/02*

U.S. Cl. 280—804 **5 Claims**



1. In a passive vehicle restraint system having a belt attached on one end adjacent the floor on one side of an occupant and attached on the second end to a driven cable disposed on the opposite side of the occupant for moving the second end between a stowed position forward of the occupant and a wearing position disposed above and behind the occupant to deploy the belt across the upper torso of the occupant, the improvement comprising:

(a) a fastening member attached to the cable for movement in combination therewith and for rotational movement about the longitudinal axis of the cable, the second end of the belt being attached to said fastening member;

(b) a stiffening member attached to said fastening member and disposed adjacent a portion of the belt extending from the point of attachment of the belt to said fastening member, said stiffening member being adapted to rotate the belt about the longitudinal axis of the cable in combination with said fastening member; and,

(c) guide means disposed adjacent the cable for contacting said fastening member and moving said fastening member in a pre-established rotational orientation as the second end of the belt is moved between the stowed and wearing positions to maneuver the belt away from the head of the occupant and for urging the belt into the correct orientation relative to the occupant's shoulder in the wearing position.

4,220,356

RECORDING MATERIALS CONTAINING CHROMENOINDOLES

Hideo Usui; Sadao Ishige, both of Minami-ashigara, and Keiso Saeki, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

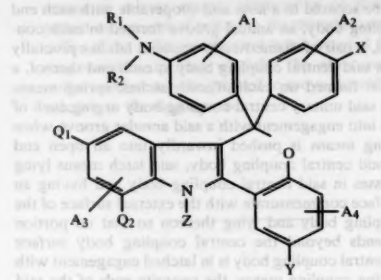
Continuation-in-part of Ser. No. 827,053, Aug. 23, 1977, abandoned. This application Mar. 1, 1979, Ser. No. 16,465

Claims priority, application Japan, Aug. 24, 1976, 51-100971

Int. Cl.² B41M *5/16, 5/22*

U.S. Cl. 282—27.5 **12 Claims**

1. A pressure-sensitive recording material comprising a support having thereon a layer of microcapsules containing at least one chromenoindole derivative color former which is capable of forming a color upon contact with an electron acceptor material and which is represented by the following general formula (I):



(I)

wherein R_1 and R_2, which may be the same or different, each represents an alkyl group, an alkyl group substituted with one or more of a cyano group, a halogen atom or an alkoxy group, an aralkyl group, a phenyl group or a phenyl group substituted with one or more of an alkyl group or a halogen atom; X represents a hydrogen atom, an alkoxy group, a dialkylamino group, an alkylarylamino group, an alkylaralkylamino group, a diaralkylamino group, an acylamino group, a halogen atom or an alkyl group; Y represents a hydrogen atom, an alkyl group, a halogen atom, an alkoxy group or a nitro group; Z represents an acyl group, a carbamoyl group, an alkoxycarbonyl group, a sulfamoyl group or a sulfonyl group; Q_1 and Q_2, which may be the same or different, each represents a hydrogen atom, a lower alkyl group or a halogen atom; and A_1, A_2, A_3 and A_4, which may be the same or different, each represents a halogen atom, an alkyl group or an alkoxy group.

4,220,357

DIPHENYLPHTHALIDE DUPLICATING AND MARKING SYSTEMS

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

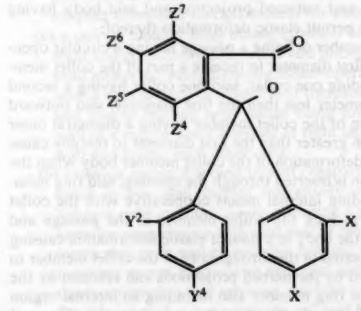
Division of Ser. No. 894,682, Apr. 10, 1978, abandoned, which is a division of Ser. No. 740,592, Nov. 10, 1976, Pat. No. 4,094,877, which is a continuation-in-part of Ser. No. 527,757, Nov. 27, 1974, Pat. No. 4,032,527, which is a continuation-in-part of Ser. No. 314,443, Dec. 12, 1972, Pat. No. 4,096,176. This application Mar. 28, 1979, Ser. No. 24,738

Claims priority, application Canada, Dec. 5, 1973, 187401

Int. Cl.[2] B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **8 Claims**

1. A pressure-sensitive duplicating system comprising a support sheet having a coat of pressure-rupturable carboxymethylcellulose-gelatin microcapsules containing an oil solution of a 3-(2-X-4-X-phenyl)-3-(2-Y^2-4-Y^4-phenyl)-4-Z^4-5-Z^5-6-Z^6-7-Z^7-phthalide of the formula



wherein:

X is dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms;

Y^2 is hydrogen, non-tertiary alkyl of one to four carbon atoms, dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms, alkanoylamino of two to five carbon atoms, non-tertiary alkoxy of one to four carbon atoms or halo;

Y^4 is the same as Y^2 when Y^2 is dialkylamino; or dialkylamino, pyrrolidino, piperidino, morpholino, alkylbenzylamino, alkyl(4-alkoxyphenyl)amino or alkyl(Q-$(CH_2)_n$amino, wherein alkyl is non-tertiary alkyl of one to four carbon atoms, alkoxy is non-tertiary alkoxy of one to four carbon atoms, Q is hydroxy or chloro and n is two to four when Y^2 is other than dialkylamino;

Z^4 is hydrogen or halo;

Z^5 is hydrogen or halo; or non-tertiary alkyl of one to four carbon atoms, nitro, amino or dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms when Z^4, Z^6 and Z^7 are each hydrogen;

Z^6 is hydrogen or halo; or non-tertiary alkyl of one to four carbon atoms, nitro, amino or dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms when Z^4, Z^5 and Z^7 are each hydrogen; and Z^7 is hydrogen or halo.

4,220,358

PIPE COUPLING

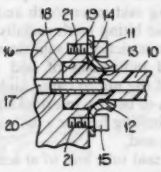
Edward N. Gaffney, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 24, 1979, Ser. No. 6,166

Claims priority, application United Kingdom, Feb. 7, 1978, 4794/78

Int. Cl.[2] F16L *33/00*

U.S. Cl. 285—242 **5 Claims**



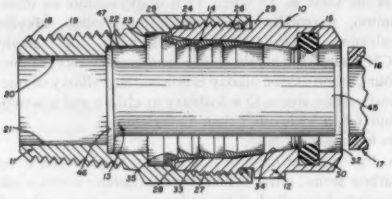
1. A high pressure flexible hose connection comprising a flexible hose having an integral end portion of enlarged cross-section, a fixing member slidably mounted on the hose, the fixing member having a hose receiving aperture therethrough which has a diameter less than that of the enlarged end portion of the hose, an associated part to which the hose is to be connected, said associated part having a fluid passage therein opening into a base of a recess which has a cylindrial side wall and which is provided in a surface of the associated part, a spigot having a passage therethrough in communication with the fluid passage in the associated part, said spigot extending from the base of the cylindrical recess, the cylindrical recess being adapted to receive the enlarged end portion of the hose and having a diameter marginally greater than that of the enlarged end portion of the hose, and means being provided for urging the fixing member and the associated part together whereby, in use, the enlarged end portion of the flexible hose is urged against the base of the recess around the spigot and thus deformed inwardly and outwardly to effect a seal between the hose and the spigot and the side wall of the cylindrial recess of the associated part.

4,220,359

PUSH-TO-CONNECT AIR BRAKE FITTING

James E. Evenson, Chicago; Richard M. Kleckner, Arlington Heights, and James W. Ma, Des Plaines, all of Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed May 30, 1978, Ser. No. 910,312
Int. Cl.[2] F16L *33/22*
U.S. Cl. 285—249 **15 Claims**



1. In a push-to-connect fitting for sealed connection to a synthetic resin tube end, the fitting including a body having a through bore defining a stepped recess at an axially outer end thereof, and an eyelet coaxially received in said recess for coaxially receiving and internally supporting a tube end therein, the improvement comprising:

a nut removably secured to said body coaxially of said bore and having a tubular guide portion spaced coaxially about said eyelet within said recess and defining axially outwardly narrowing frustoconical camming surface means;

a radially constrictible tubular sleeve received coaxially within said guide portion and defining a plurality of coaxial, annular, axially spaced biting teeth including an axially inner tooth and at least one axially outer tooth, said inner tooth having an inner diameter less than the inner diameter of said at least one axially outer tooth, said inner tooth have a preselected configuration defining means for permitting axial inward movement of the tube end between said inner tooth and said eyelet and providing interlocking engagement of said sleeve with said tube end as an incident of axially outward movement of the tube end and sleeve between said nut and said eyelet said guide portion of the nut urging said inner tooth and at least the axially outermost of said biting teeth radially inwardly solely as an incident of constriction of said sleeve as a result of said axially outward movement of said sleeve against said guide portion of the nut to cause said at least one axially outermost tooth to be also interlocked with said tube end for effectively limiting further axially outward movement of the tube end; and

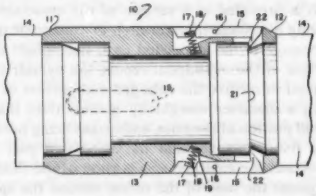
means for sealing said tube end to at least one of said body and nut members.

4,220,360

HOSE COUPLING

Edwin S. Jacek, and Janet B. Jacek, both of 3306 NE. 15th St., Fort Lauderdale, Fla.

Filed Mar. 30, 1979, Ser. No. 25,349
Int. Cl.[2] F16L *21/00, 37/12*
U.S. Cl. 285—317 **2 Claims**



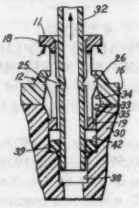
1. A hose coupling comprising a central unitary coupling body open at each end thereof and having a central external cylindrical surface portion, a pair of like coupling means, each adapted to be secured to a hose and cooperable with each end of the coupling body, an annual groove formed in each coupling means, a pair of diametrically opposed latches pivotally mounted on said central coupling body at each end thereof, a hook portion formed on each of said latches, spring means mounted in said unitary central coupling body urging each of said latches into engagement with a said annular groove when said coupling means is pushed inwardly into an open end formed in said central coupling body, said latch means lying within recesses in said central coupling body and having an external surface commensurate with the external surface of the central coupling body and lying thereon so that no portion thereof extends beyond the central coupling body surface when said central coupling body is in latched engagement with its cooperating coupling means, the opposite ends of the said central coupling body being frustoconical with the outer diameter of the apex equal to the outer diameter of the coupling means and the outer diameter of the base equal to the outer diameter of the central cylindrical portion of the coupling body whereby smooth and unobstructed conical transitional surfaces are provided for the coupling to prevent its impalement when in use on obstructions such as curbs, doors, or the like.

4,220,361

CONNECTOR FOR PLASTIC TUBING

Karl A. Brandenberg, Chehalis, Wash., assignor to The Aro Corporation, Bryan, Ohio

Filed Feb. 1, 1979, Ser. No. 8,525
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—323 **12 Claims**



1. An improved fitting for releasably retaining tubing, said fitting comprising, in combination:

a collet member and a cooperating ring member;

said collet member including two solid circumferential collars connected by flexible elastic elongated body, said body defining a longitudinal axis, said body having an axial throughbore through the body to receive the tubing, an outward projection intermediate the collars, inward barb projections in the throughbore, generally radially opposite said outward projection and said body having means to permit elastic deformation thereof;

said ring member defining a passage having a circular opening of a first diameter to receive a part of the collet member including one collar, said one collar having a second outer diameter less than the first diameter, said outward projection of the collet member having a diametral outer dimension greater than the first diameter to thereby cause elastical deformation of the collet member body when the projection is inserted through the opening, said ring member including internal means cooperative with the collet member to lock the collet member in the passage and maintain the body in a state of elastic deformation causing a tube inserted in the throughbore of the collet member to be gripped by the barbed projections and retained by the fitting, the ring member also including an internal region with a diametral dimension greater than the diametral

dimension of the one collar and the body and providing means to release elastic deformation of the body and permit movement of tubing in the throughbore; the other collar of the collet member not being inserted through the ring member opening whereby the other collar of the collet member may be gripped to move the collet member relative to the ring member.

4,220,362

KNOTTING APPARATUS FOR SPOOLING MACHINES

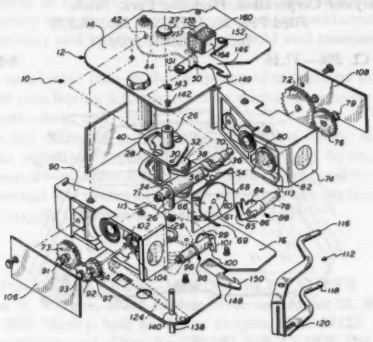
Kresimir Mista, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik, Obertshausen, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,766

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741785

Int. Cl.[2] A01D *59/04*

U.S. Cl. 289—2 **9 Claims**



1. A knotting apparatus for spooling machines comprising, in combination:

(a) housing means divided into two sections, the first of said sections and the second of said sections having disposed therein the driving linkages and the knotting mechanisms of said knotting apparatus, respectively, said knotting mechanisms being operatively coupled to said linkages, said second section defining a compartment and being adapted to receive threads therein for knotting;

(c) a pair of binding head means disposed in said compartment and operatively coupled to said linkages said binding head means including a cutting means operated by contact with a cam surface circumscribed thereabout, and one of said pair of binding head means being journaled in each wall of a pair of walls disposed at right angles to said one wall and facing each other; and

(b) crossing means disposed in said compartment and journaled in one wall thereof operatively coupled to said linkages, said crossing means including a pair of crossing arms for cooperating with said pair of binding heads and interacting with said threads for forming knots;

(d) driving means disposed in said first section and operatively coupled to said spooling machine and said linkages for driving said crossing means and said binding heads.

4,220,363

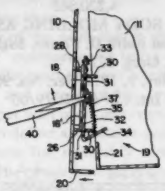
LATCH FOR METER BOX

Joseph J. Foster, Jr., Magnolia, and Walter C. Schneider, North Canton, both of Ohio, assignors to Superior Switchboard & Devices Division of The Union Metal Manufacturing Co., Canton, Ohio

Filed Apr. 30, 1979, Ser. No. 34,296

Int. Cl.[3] E05C *1/12*

U.S. Cl. 292—164 **6 Claims**



1. Latch means for locking a cover on a box against unauthorized opening, said cover having an access opening normally closed by a frangible plate on the inside of said cover and said box having an angular flange at its front periphery, said latch means comprising a latch bar slidably mounted on the inner surface of said cover proximate said access opening and adapted at one end to move behind said angular flange when the cover is closed, and a shoulder on said latch bar behind said access opening to receive the end of a tool inserted through said opening for moving said latch bar end from behind said flange.

4,220,364

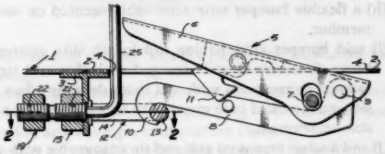
FLUSH TYPE LATCHES

L. Richard Poe, Long Beach, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Mar. 1, 1978, Ser. No. 882,174

Int. Cl.[2] E05B *15/02*

U.S. Cl. 292—341.18 **2 Claims**



1. A tension adjuster for a latch having a handle movable between a position flush with a surrounding panel set in a surface structure and an angular position diverging from said panel wherein the extended end of the handle and corresponding portion of said panel forms an aperture exposing a limited area underlying the panel and exposing a panel frame, the latch also having a hook arm extending into said limited area, the tension adjuster comprising:

a. a keeper engaging the hook arm and continuing therefrom;

b. a mounting body secured to the panel frame and slidably receiving the keeper;

c. a drive bar having a first connection with the housing and a second connection wsith the keeper wherein both connections between the drive bar, keeper and housing are screwthreaded and of opposite pitch whereby rotation in one direction increases tension on the hook arm, while rotation in the opposite direction reduces tension on the hook arm, the screwthreaded connections being of equal pitch whereby the drive bar remains essentially in a fixed position one of the connections being screwthreaded to

effect reciprocal movement of the keeper upon rotation of the drive bar; and

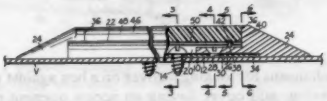
d. the drive bar having a turning socket extending into one end for receiving a turning tool inserted through said aperture.

4,220,365

VEHICLE BODY MOLDING ASSEMBLY

Marvin L. Foster, and Keith D. Foster, both of 10005 E. Burnside St., Portland, Oreg. 97216

Filed Nov. 9, 1978, Ser. No. 959,228
Int. Cl.³ B60R *19/00*
U.S. Cl. 293—128 **3 Claims**



1. A vehicle body molding assembly comprising

(a) an elongated base member having a flat wall portion arranged to abut against a vehicle body surface,

(b) means arranged to secure said base member in abutment with a vehicle body surface,

(c) a side wall on each side of said flat wall portion forming a channel-like structure with open ends,

(d) said side walls having outer defining edges,

(e) an end tip arranged to be disposed adjacent at least one end of said base member,

(f) said end tip having opposite ends and having a tongue portion projecting from one end thereof into an open end of said base member and lying flat on said flat wall portion,

(g) means securing said tongue portion to said flat wall portion with an end of said tip closely adjacent an end of said base member,

(h) a flexible bumper strip removably secured on said base member,

(i) said bumper strip having full length side grooves and being dimensioned and arranged such that said strip has snap-on engagement with said outer defining edges of the side walls of said base member to accomplish said removable securement,

(j) and anchor means on said end tip engageable with an end portion of said bumper strip for holding said end portion closely up against the adjacent end of said end tip regardless of contraction forces acting on said bumper strip as a result of temperature changes.

4,220,366

LIFTER FOR VALVE-BOXES

William R. Trudell, 7173 Quincey La., Clearwater, Fla. 33516

Filed Apr. 20, 1979, Ser. No. 31,832
Int. Cl.³ B25B *7/00*
U.S. Cl. 294—104 **7 Claims**

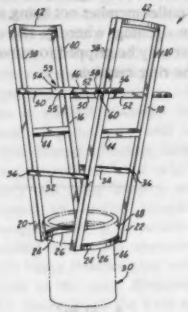
1. A lifting device for removing valve-boxes from the ground, said lifting device comprising:

a pair of side frames;

said side frames each having an end portion cooperatively aligned to define a segmented gripping jaw;

at least one foldable locking hinge, said locking hinge being pivotally attached at each end to one of said side frames;

at least one linking bar, said linking bar being pivotally attached at each end to one of said side frames, said linking bar being pivotally attached to said side frames at a position intermediate to said foldable locking hinge and said gripping jaw.

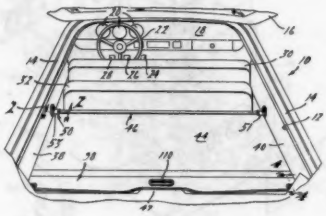


4,220,367

VEHICLE REMOVABLE SECURITY CURTAIN

Thomas C. Gale, Rochester; Richard A. Graves, Bloomfield Hills, and Mark Lobanoff, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Feb. 26, 1979, Ser. No. 15,379
Int. Cl.³ B60R *5/04*
U.S. Cl. 296—37.16 **5 Claims**



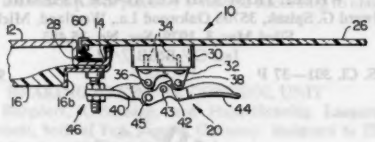
1. An easily removable security curtain and support mechanism to selectively cover a vehicle luggage space formed between spaced vehicle walls, comprising: a strip of flexible material extending over the luggage space in a generally horizontal plane when in an operative security position; an elongated roller member extending horizontally between the vehicle walls; means supporting the ends of the roller member in a manner permitting rotation thereof so that the flexible material may wrap around the roller member as it moves into a stored operative position; the end support means including a first member operatively attached to the ends of the roller member in a manner permitting both rotative and axial movement thereto and a second member adapted for fixed attachment to the spaced vehicle walls and including a generally vertical channel therein open at the upper portion and towards the first member; a nose portion of the first member with an end surface engaging a bottom channel wall of the second member as the nose portion is moved vertically in the channel during assembly and disassembly of the security curtain and support mechanism; the bottom channel wall including first and second oppositely inclined surfaces from the vertical intersecting at an axially inward ridge portion toward the end of the roller member thereby causing the first end support member to first move axially inward and then axially outward during assembly movement downward in the channel.

4,220,368

REMOVABLE PLASTIC ROOF PANEL

Paul J. Ferrigan, Bolton Landing, N.Y., assignor to Saratoga Sunroof Corporation, Clifton Park, N.Y.

Filed May 25, 1978, Ser. No. 909,508
Int. Cl.[2] B60J *7/00*
U.S. Cl. 296—215 **4 Claims**



1. A removable light weight plastic panel for the roof of a motor vehicle, which vehicle has a roof with a generally rectangular opening for receiving a rigid roof panel and a formed metal rain trench extending peripherally around said rectangular roof opening, said plastic panel comprising:

(a) a thin transparent sheet formed to substantially the same contour as the rigid roof panel, and equipped with,

(b) identical pairs of attachment means adjacent the front and rear sides of said sheet and mounted on the inside surface of said transparent sheet and adapted for engagement with the recesses provided in the headliner of the vehicle at the front and rear edges respectively of the opening for securing the rigid roof panel, and said recesses receiving said attachment means to hold said transparent sheet,

(c) a metal edge trim on the periphery of said plastic sheet, said trim having a C-shaped cross section to receive said plastic sheet, and

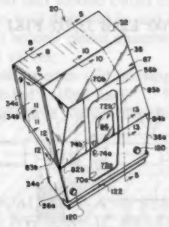
(d) a seal extending peripherally around said plastic sheet, said peripherally extending metal edge trim having an inwardly open slot for receiving a rib on said seal to support said seal so that its free depending portion fits into the metal rain trench in the vehicle.

4,220,369

FOLDABLE TRUNK-MOUNTABLE CAMPER

William N. Whitley, 19315 Shaker Blvd., and James M. Whitley, 2963 Morley, both of Shaker Heights, Ohio 44122

Continuation-in-part of Ser. No. 880,083, Feb. 22, 1978, Pat. No. 4,181,348, and Ser. No. 880,319, Feb. 22, 1978. This application Aug. 21, 1978, Ser. No. 935,649
Int. Cl.[2] B60D *3/32*
U.S. Cl. 296—164 **20 Claims**



1. A trunk-mountable camper capsule for automobiles, comprising:

(a) structure defining a relatively tall "primary" compartment adapted to be positioned rearwardly of the trunk compartment of an automobile, and defining a relatively shorter "secondary" compartment communicating with upper portions of the primary compartment and extending forwardly therefrom for overlying the trunk compartment of an automobile;

(b) the structure including first and second bottom walls defining the floors of the "primary" and "secondary" compartments, respectively, and including front, rear, top and side wall portions cooperating with the bottom walls to define an enclosure;

(c) lower portions of the walls which define the "primary" and "secondary" compartments being formed from rigid materials and cooperating to define a relatively rigid, upwardly-opening base;

(d) upper portions of the walls which define the "primary" and "secondary" compartments being movable between a collapsed over-the-road position overlying the upwardly opening base, and an extended, operational position wherein the upper wall portions cooperate with the lower wall portions to define a habitable enclosure; and,

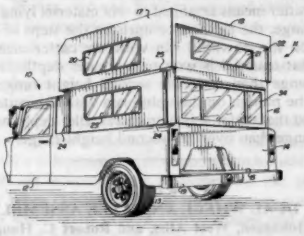
(e) mounting means for releasably mounting the camper capsule about the trunk compartment of an automobile with the "primary" compartment rearwardly of the trunk compartment and with the "secondary" compartment overlying the trunk compartment.

4,220,370

TELESCOPING CAMPER

James D. Rice, 18 Tennessee La., Auburndale, Fla. 33823

Filed Nov. 1, 1978, Ser. No. 956,614
Int. Cl.[3] B62P *3/32*
U.S. Cl. 296—165 **7 Claims**



1. A telescoping camper body for pickup trucks, and the like, comprising:

a lower body portion adapted to be attached to a truck body;

a telescoping body portion telescoping over the lower body portion and having a roof portion thereon;

a plurality of vertically extending exterior tracks formed in the sides of said lower body portion;

a plurality of guides on said telescoping body portion riding on said lower body portion tracks;

internal cylinders mounted in said lower body portion vertically extending exterior tracks;

internal rods slidably mounted in said internal cylinder and extending therefrom and attached at one end to the roof portion of said upper telescoping body portion, whereby said external tracks and guides and internal cylinders and internal rods are positioned for smoothly raising and lowering said telescoping body portion on said lower body portion of said camper body;

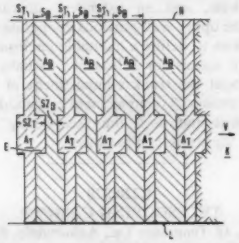
a pair of cots attached to said lower body portion adjacent said roof portion of said telescoping body portion when said telescoping body portion is in a lowered position, said beds being adapted to be folded up when said telescoping body portion is raised; and

a hinged flap attached to the rear side of said telescoping body portion and a hinged window attached to said hinged flap thereby allowing said hinged window to be folded adjacent said roof portion of said telescoping body portion and over a portion of said cots.

4,220,371
METHOD OF MINERAL MINING PLOUGH OPERATION IN TWO DIRECTIONS OF VARYING DEPTH CUT

Gerhard Merten, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Division of Ser. No. 877,969, Feb. 15, 1978, Pat. No. 4,178,040.
This application May 3, 1979, Ser. No. 35,707
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1977, 2707724
Int. Cl.[2] E21C *27/34, 41/00*
U.S. Cl. 299—18 5 Claims

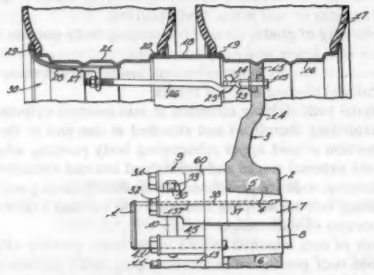


1. A method of winning material in a mineral mining working utilising a mineral mining plough which is movable to and fro alongside a conveyor, the plough having first cutter means arranged to win material lying in a first height range, and second cutter means arranged to win material lying in a second height range, the method comprising the steps of driving the plough on the downhill run with the cutter means so positioned that material is won to a greater depth over the first height range than over the second height range, and then driving the plough on the uphill run with the cutter means so positioned that material is won to a smaller depth over the first height range than over the second height range.

4,220,372
DUAL WHEEL AND AXLE ASSEMBLY

Roy W. Johansen, West Allis, and Robert C. Haupt, Wauwatosa, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 6, 1978, Ser. No. 957,737
Int. Cl.[2] B60B *11/06, 37/04*
U.S. Cl. 301—1 10 Claims



1. An adjustable wheel and axle assembly comprising, a wheel including a hub defining a tapered central opening, a drive axle received in said opening, at least two wedged bushing segments disposed within the central opening and mounted on said drive axle, axial drive means forcing said bushing segments to lock said axle in said hub, an extension fastened on one of said wedged bushing segments and extending axially from said wheel hub, means aligning said extension with said bushing, clamping means on said extension for clamping said drive axle to said extension on said bushing segment to thereby increase the bearing surface on said shaft and lock said axle to said hub.

4,220,373
WHEEL TRIM AND RETAINER ASSEMBLY

Edward G. Spisak, 35700 Oakwood La., Westland, Mich. 48185

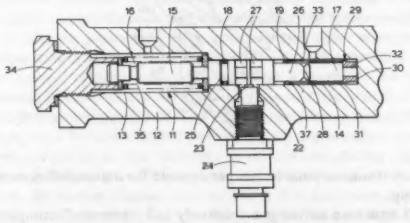
Filed May 3, 1979, Ser. No. 35,485
Int. Cl.[2] B60B *7/04*
U.S. Cl. 301—37 P 9 Claims

1. A wheel trim assembly for mounting on a vehicle wheel comprising; a cover member having a radially extending peripheral flange, an annular retaining ring disposed at one side of said cover member, a plurality of retaining elements uniformly spaced on said retaining ring and adapted to engage said wheel to maintain said trim assembly on said wheel, an annular axially extending rib radially inset from the outer edge of said peripheral flange and formed on the inboard side of said cover member, said retaining ring having an axially extending flange seated on the radial outer surface of said rib to maintain said retaining ring coaxially to said cover member, said retaining ring having a radially extending flange abutting with the inboard side of said peripheral flange, a clamping ring engaging the inboard surface of said retaining ring flange and the outboard side of said peripheral flange to maintain said flanges in abutting relationship to each other.

4,220,374
METHOD FOR LOCATING ANNULAR SEALS AND ARTICLE PRODUCED THEREBY

Harold Hodkinson, Coventry, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Dec. 5, 1978, Ser. No. 966,641
Claims priority, application United Kingdom, Dec. 8, 1977, 51079/77
Int. Cl.[2] B60T *13/00;* E21B *33/00;* F16J *9/00;* B23P *11/02*
U.S. Cl. 303—6 C 9 Claims



1. A method of placing an elastomeric annular piston seal beyond an irregularity in the wall of the bore into which the piston is to be inserted and comprising:

fitting the seal onto a portion of the piston having a smaller diameter than that on which the seal operates;

inserting the piston into the bore so that the seal moves freely past and is placed beyond the irregularity;

relatively moving the piston past an abutment by which the seal is encountered so that the seal is moved into its operable position by said relative movement.

4. Apparatus having a piston in a bore to be sealed by a seal, wherein the seal is put in place by a method according to claim 1 or 2.

4,220,375

BRAKING PRESSURE CONTROL UNIT

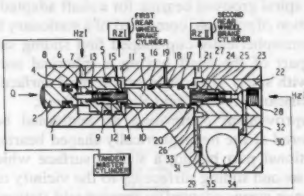
Jochen Burgdorf, Offenbach, and Hans-Henning Luepertz, Darmstadt, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 20,001

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814394; May 12, 1978, 2820768

Int. Cl.[2] B60T *8/26*

U.S. Cl. 303—6 C **13 Claims**



1. A braking pressure control unit for a vehicle hydraulic brake system having two separate brake circuits to control brakes at the rear wheels of said vehicle comprising:

a housing;

a first inlet chamber disposed in said housing coupled to a first fluid pressure source;

a second inlet chamber disposed in said housing spaced longitudinally from said first inlet chamber coupled to a second fluid source;

a first outlet chamber disposed in said housing spaced from said first and second inlet chambers connected to one of said two brake circuits;

a second outlet chamber disposed in said housing spaced from said first and second inlet chambers and said first outlet chamber connected to the other of said two brake circuits;

a first valve disposed in said housing between said first inlet chamber and said first outlet chamber;

a second valve disposed in said housing between said second inlet chamber and said second outlet chamber;

a movable partition wall disposed in said housing intermediate said first and second outlet chambers controlling said first and second valves;

a by-pass conduit disposed in said housing by-passing one of said first and second valves; and

a deceleration-responsive valve disposed in said by-pass conduit.

4,220,376

PRESSURE EQUALIZING AND STABILIZATION DEVICE FOR HYDRAULIC BRAKE SYSTEMS

Theodore P. Spero, 1751 Ellis St., Apt. 106, Concord, Calif. 94520

Continuation of Ser. No. 306,585, Nov. 15, 1972, abandoned. This application Nov. 28, 1973, Ser. No. 419,643

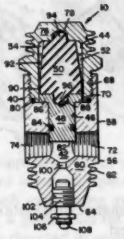
Int. Cl.[2] B60T *17/00*

U.S. Cl. 303—87 **10 Claims**

10. A pressure equalizing device adapted for use in a hydraulic brake system of a vehicle having a central power source and actuators interconnected by a fluid pressure conduit, said device comprising;

a housing having a first chamber and an enclosed fluidtight second chamber interconnected by a cylindrical bore having a diameter smaller than said second chamber, said first chamber having inlet and outlet ports extending through the wall of said housing to provide means for receiving end portions of said conduit of said system to allow fluid under pressure to flow through said first chamber;

a movable piston having a main body portion located within said cylindrical bore with one end being exposed to the fluid pressure within said first chamber, said piston having an enlarged end portion extending from said main body portion and located in said second chamber;



an elongated, resiliently yieldable member in said second chamber having one end portion engaged with said enlarged end portion of said piston and extending therefrom to contact an opposite end wall of said second chamber, said yieldable member having a smaller volume than said second chamber so that an annular space is provided around it within said second chamber;

a noncompressible liquid material partially filling said annular space with the remaining portion of said space being filled with a compressible gas or air; whereby said second chamber can accommodate distortion of the yieldable member when increased fluid pressure occurs in said first chamber and thereby creates a force against said end face of said piston causing it to press against and distort said yieldable member and to compress said gaseous material in said annular space.

4,220,377

EARTH BORING BIT WITH ECCENTRICALLY MACHINED BEARING PIN

Francis E. Phelps, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 927,696, Jul. 24, 1978, abandoned. This application Sep. 4, 1979, Ser. No. 71,904

Int. Cl.[3] F16C *17/02*

U.S. Cl. 308—8.2 **2 Claims**

1. A rolling cutter earth boring bit, comprising:

a bit body;

at least one bearing pin extending from said bit body, said bearing pin having a bearing pin central axis, a top and a bottom;

a rolling cone cutter rotatably mounted on said bearing pin, said rolling cutter having a cutter central axis;

a recess in the bottom of the bearing pin;

a bearing material filling said recess;

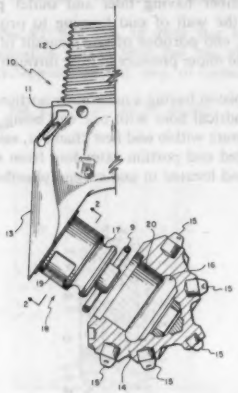
a load surface on said bearing material, said load surface having a radius that extends about an axis substantially concentric with said bearing pin central axis;

reduced clearance between said load surface and said rolling cutter providing a greater area of contact between said load surface and said rolling cutter;

an unloaded surface on said bearing pin, said unloaded sur-

face having a radius that extends about an axis eccentric to said bearing pin central axis;

lubricant between said rolling cutter and said bearing pin; greater clearance between said unloaded surface and said



rolling cutter to enhance distribution of said lubricant and prevent seizure; and

an O-ring positioned between said bearing pin and said rolling cone cutter that is substantially evenly squeezed during operation of said bit.

4,220,378

PLATE BEARING

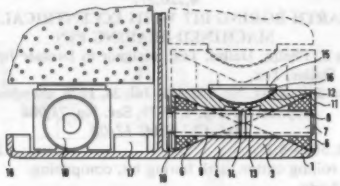
Artur Bienek, Wilh. Leuschner-Str. 35, D-5500 Trier, Fed. Rep. of Germany

Filed May 22, 1979, Ser. No. 41,317

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752589

Int. Cl.³ F16C *35/02*

U.S. Cl. 308—25 **10 Claims**



1. A height-adjustable bearing for plates to be laid in open-joint manner, the bearing comprising a base plate, at least two blocks on the base plate each provided with an internal thread, at least one bolt adapted for screw-threaded engagement with the blocks and having two oppositely orientated threaded portions, an actuating element mounted at one end of the bolt, at least one bearing pedestal on the base plate, on which said blocks can be displaced in sliding manner, a bearing brass which rests on said blocks, and a support on the bearing brass which comprises a segment of a sphere mounted for rotation in a spherical segment in the upper side of the bearing brass, the pearing pedestal being formed at those regions where it contacts the blocks as inclined planes.

4,220,379

SPIRAL GROOVED SPHERICAL BEARING

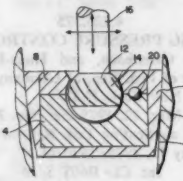
Klaus Pimiskern, Daisendorf, and Werner Herbert, Markdorf, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Fed. Rep. of Germany

Filed Mar. 16, 1979, Ser. No. 21,099

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815009

Int. Cl.² F16C *17/10*

U.S. Cl. 308—36 **2 Claims**



1. In a spiral grooved bearing for a shaft adapted to travel in the direction of rotation, composed of a stationary bearing part with a hemispherically cup-shaped first sliding surface and a bearing part of the shaft having a spherical second sliding surface with spiral grooves in said second surface adapted to feed a lubricant between said sliding surfaces,

the improvement comprising an additional bearing part centered at the hemispherically-shaped bearing part, said additional part having a sliding surface which encloses said second sliding surface up to the vicinity of said shaft, and sleeve means adapted to receive said stationary bearing part and said additional part.

4,220,380

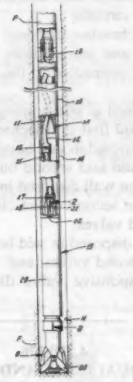
BEARING ASSEMBLY

Gary M. Crase, Cypress; Kurt H. Trezeciak, Fountain Valley, and John E. Tschirky, Long Beach, all of Calif., assignors to Smith International Inc., Newport Beach, Calif.

Filed Jan. 15, 1979, Ser. No. 3,783

Int. Cl.³ F16C *19/14*

U.S. Cl. 308—174 **24 Claims**



1. In a fluid driven drilling assembly, a fluid driven motor having a stator connectable to a drilling fluid conduit, a fluid driven rotor, a bearing assembly having a housing connected at one end to said stator to receive drilling fluid therefrom, a drive shaft in said housing and connected to said rotor to be driven rotatably thereby, said drive shaft having a fluid inlet for drilling fluid from said housing and a flow passage extending from said inlet through said drive shaft, bearing means

between said housing and said shaft including thrust members to transmit thrust therebetween, and flow restrictor means between said shaft and said housing to limit the flow of fluid through said bearing means: the improvement wherein said bearing means includes a plurality of thrust bearings, said flow restrictor means being located between a pair of said thrust bearings, said housing having a single thrust transfer shoulder for loading said thrust bearings, and thrust transmitting means for distributing the load from said shoulder to said thrust bearings.

4,220,381

DRILL PIPE TELEMETERING SYSTEM WITH ELECTRODES EXPOSED TO MUD

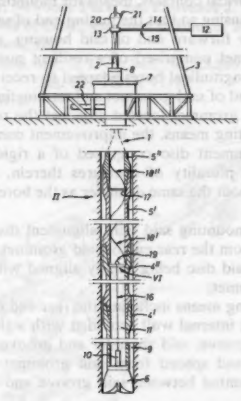
Gerardus C. van der Graaf, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 9, 1979, Ser. No. 28,487

Claims priority, application United Kingdom, Apr. 7, 1978, 13752/78

Int. Cl.³ G01V *1/40*

U.S. Cl. 339—16 C **7 Claims**



1. A pipe section for use in rotary drilling a borehole while circulating a drilling fluid, said pipe section terminating at opposite ends with mechanical coupling means adapted for effecting detachable interconnection with adjoining identical pipe sections, the improvement comprising:

an electrical conductor extending through said pipe section,

an electrode means disposed near the ends of said pipe section, said electrode means being coupled to said electrical conductor and insulated from said pipe section, said electrode means in addition electrically cooperating with the electrode means of the adjoining pipe section and positioned in a space that communicates with the drilling fluid when said pipe sections are fully interconnected; and,

an amplifier means wherein at least one amplifier is disposed in circuit with said electrical conductor and said electrode means.

4,220,382

BUSSING CONNECTOR

Leon T. Ritchie, Mechanicsburg, and John A. Woratyla, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1978, Ser. No. 970,089

Int. Cl.³ H05K *1/07*

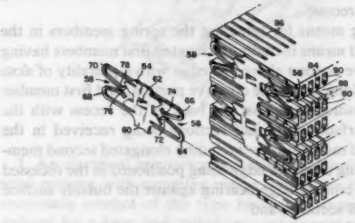
U.S. Cl. 339—17 LM **7 Claims**

1. A bussing system comprising:

a housing having first and second oppositely directed mating faces each defining at least two elongated, parallel, spaced circuit board receiving apertures extending completely through said housing to open on both mating faces;

at least one transversely extending, terminal strip receiving groove in said housing intersecting each said aperture;

a plurality of terminal strips each adapted to be mounted in a respective one of said grooves, each said terminal strip having a plurality of identical terminal portions extending in both directions from marginal edges of a carrier web, each said terminal portion lying in the plane of said strip and having a profiled base defining a central board receiving recess and a pair of cantilever spring arms extending



outwardly from opposite ends of said profiled base defining a circuit board receiving space therebetween leading to said recess, each said spring arm being doubled upon itself and having a protrusion on the adjacent edge portions of said arms directed to engage respective sides of a circuit board, said terminal portions being spaced sufficiently to be received on a respective aperture whereby circuit boards received in said system will have like portions thereof bussed together by said terminal strips whereby said system can accommodate circuit boards entering from both sides thereof.

4,220,383

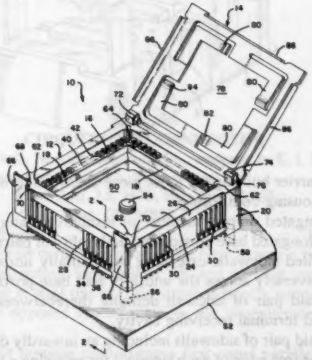
SURFACE TO SURFACE CONNECTOR

William S. Scheingold, Palmyra, and Frank C. Youngfleish, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 971,629, Dec. 20, 1978, abandoned, which is a continuation of Ser. No. 851,338, Nov. 14, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,567

Int. Cl.² H05K *1/12*

U.S. Cl. 339—17 CF **1 Claim**



1. An electrical connector for connecting a semi-conductor chip carrier or the like to a printed circuit board, comprising:

a. a frame of insulating material having four sidewalls with each sidewall having a plurality of vertically extending cells opening outwardly and downwardly with each cell

having a window opening upwardly, and an outwardly opening recess in and extending along the length of each sidewall, said sidewalls defining a central compartment;

b. a plurality of conductive spring members being generally S-shaped with contacts being provided on an upper portion and lower portion and having a tail section extending from the lower portion and comprising a vertical and horizontal section, said spring members being positioned in the cells with the upper portion contact pushing out through the window, the lower portion contact depending below the frame for biasing positioning on circuits on the printed circuit board and said tail section extending into the recess;

c. retaining means for retaining the spring members in the cells, said means including elongated first members having a concave portion along one edge with a plurality of slots spaced along and in the concave portion, said first member being positioned against the back of the recess with the inside surface of the tail sections being received in the slots, said means further including elongated second members having a convex edge being positioned in the recessed with the convex edge bearing against the outside surface of the tail sections; and

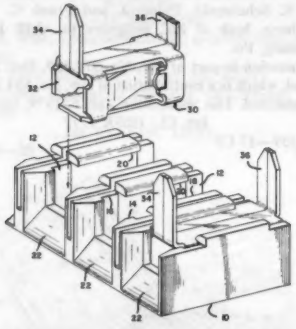
d. a cover hinged to the frame, said cover having spring means thereon so that upon placing a semi-conductor chip carrier into the central compartment and closing the cover, the spring means bias the carrier downwardly against the spring member contacts in the windows.

4,220,384

LOOSE PIECE TERMINAL MOUNTING ASSEMBLY

Richard P. Clark, Camp Hill, and Gary L. Zimmerman, Shermans Dale, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 20, 1978, Ser. No. 953,294
Int. Cl.³ H01R *13/48*
U.S. Cl. 339—59 M **6 Claims**



1. A carrier housing for loose piece electrical terminals, said carrier housing comprising:

an elongated unitary member of insulative material having an elongated base portion and a plurality of pairs of spaced profiled sidewalls extending substantially normal to and transversely across the width of said base portion,

each said pair of sidewall defining therebetween an elongated terminal receiving cavity,

each said pair of sidewalls including an inwardly directed lip at the free edge of each sidewall for retaining a terminal in said cavity,

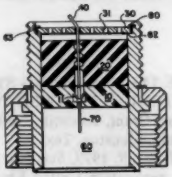
the adjacent sidewalls of adjacent pairs of sidewalls being spaced apart whereby said carrier housing can be bent and flexed without reducing the gripping forces applied to each terminal carried thereby.

4,220,385

ELECTRICAL CONNECTOR

Vincent A. Luca, Jr., Sidney; Carl L. Knapp, Oneonta, and Alan L. Schildkraut, Sidney, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Feb. 28, 1979, Ser. No. 16,719
Int. Cl.³ H01R *13/48, 13/58*
U.S. Cl. 339—59 M **7 Claims**



1. In combination with an electrical connector of the type having a housing having a front and a rear end, a plurality of mateable electrical contacts, means for mounting said contacts within said housing so that the mating end of said contacts are located at the forward end of said housing, and a moisture sealing grommet comprised of a resilient material having a plurality of longitudinal bores adapted to receive wires entering the rear end of said grommet and terminating at respective contacts, said grommet located adjacent the rear end of said contact mounting means, the improvement comprising:

a wire alignment disc comprised of a rigid material and having a plurality of apertures therein, said apertures having about the same diameter as the bores in said grommet; and

means for mounting said wire alignment disc spaced rearwardly from the rear end of said grommet with the apertures in said disc being axially aligned with the bores in said grommet;

said mounting means including the rear end of said housing having an internal wall provided with a shoulder and an annular groove, said shoulder and groove being located adjacent and spaced from said grommet and said disc being mounted between said groove and said shoulder; and

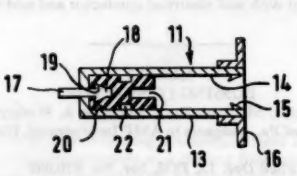
a snap ring in said groove captivating said disc between said shoulder and said snap ring, said disc being spaced from the grommet preventing moisture from reaching the contacts by preventing lateral forces acting on the wires.

4,220,386

PLUG AND SOCKET CONNECTORS

John Kenny, Sawbridgeworth, England, assignor to Needle Industries Limited, Warwickshire, England

Filed Mar. 9, 1978, Ser. No. 884,830
Claims priority, application United Kingdom, Mar. 10, 1977, 10280/77
Int. Cl.² H01R *11/18;* A61N *1/04;* H01R *13/52*
U.S. Cl. 339—60 R **9 Claims**



1. A plug and socket electrical connector, which connector comprises a plug member for electrical connection to a conductor and a socket member for receiving the plug member, the plug member having an insulating body portion and a

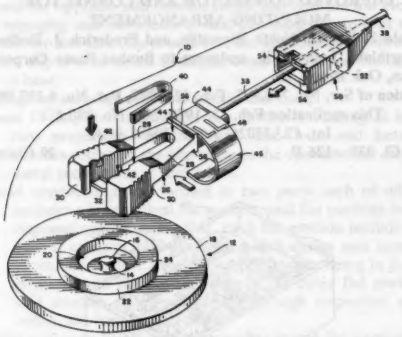
conducting spigot projecting from said body portion and to which said conductor is connectible, the socket member defining a bore for sealingly receiving said body portion of the plug member, a block of conducting resilient rubber material located within said bore, the block of rubber material defining a first recess for receiving the spigot of said plug member and defining a further recess spaced from said first recess for receiving the spigot, and an electrical contact provided through the walls of the socket member defining said bore and making electrical connection with said block of rubber material, and said first recess in said block of conducting rubber material having a smaller cross-sectional dimension than that of said spigot, whereby the block is deformed by insertion of said spigot into said first recess to make an electrical connection therebetween, said deformation of the block of rubber material caused by insertion of said spigot into said first recess being accomodated at least in part by a reduction in volume of said further recess.

4,220,387

MEDICAL CLIP

Barton A. Biche, Newbury Park, and Lawrence J. Stupay, Thousand Oaks, both of Calif., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 2, 1979, Ser. No. 25,699
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—61 R **10 Claims**



1. A terminal clip for use with electrodes of the general type having a male projection with an enlarged diameter head portion thereon, said male projection being disposed within a recessed area in the electrode, comprising:

a pair of support arms integrally formed of resilient dielectric plastic material in an initial unstressed generally V-shape so that the arms are secured together at one end and normally spaced from each other at the other end, said arms having offset depending shoulder portions spaced from said one end and which are positionable within said recessed area of said electrode when the arms are moved toward each other; and

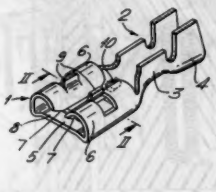
a conductive loop extending inwardly from the depending shoulder portion of each of said arms toward the other arm and overlappable with each other when the arms are moved toward each other to form an aligned aperture sufficiently large to pass over said head portion when so overlapped, said conductive loops being defined by an offset end of a flat, thin, generally L-shaped integral conductive member embedded within said dielectric plastic arms, with offset ends of the L-shaped conductive members extending into the offset depending shoulder portions of said arms, and with the legs of the L-shaped conductive members extending along and within the support arms to said one ends thereof for connection to a lead wire or the like.

4,220,388

ELECTRICAL CONNECTOR AND CONTACT AND HOUSING THEREFOR

Helen Dechelette, St. Cloud, France

Filed Sep. 11, 1978, Ser. No. 941,509
Claims priority, application France, Sep. 9, 1977, 77 27388
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—74 R **15 Claims**



1. An electrical connector comprising a housing having an axial passage with camming means within the passage and a receptacle contact of the type having tab-receiving passage defined by a base and rolled-over edge portions, said edge portions being formed with outwardly directed projections engageable with said camming means, so that on movement of the receptacle contact relative to and within the housing, such engagement serving to urge the two projections away from each other thereby to effect an increase in the effective cross-sectional area of the tab-receiving passage of the receptacle contact, said housing being a one-piece moulding of electrically insulating plastics material, and is generally rectanguloid in shape, having a bottom wall, a top wall and side walls, the housing being open at its axial ends, said camming means including the top wall being formed in its inner surface with two spaced apart grooves defining opposing, laterally facing surfaces open to a forward end of the housing, the laterally facing surfaces having a first part extending rearwardly from the forward end of the housing parallel to the housing's side walls, and a second part extending obliquely towards the side walls, the laterally facing surfaces each terminating in a shoulder surface facing the forward end of the housing, the projections of the receptacle contact being received against the laterally facing surfaces in the top wall of the housing.

4,220,389

CIRCUIT CARD CONNECTOR

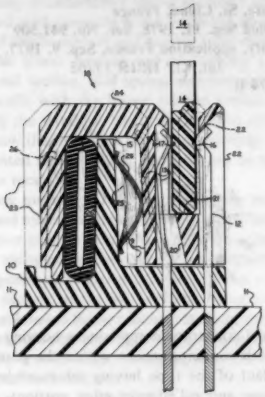
Mark S. Schell, New Cumberland, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 13, 1979, Ser. No. 65,865
Int. Cl.³ H05K *1/07*
U.S. Cl. 339—74 R **8 Claims**

1. In a circuit card connector of the type having a rigid base with an upstanding longitudinal rib and at least one inside terminal and at least one outside terminal fixedly supported by said base in opposed spaced relation, the improvement which comprises

a movable housing comprising a first panel parallel to said rib and located between said rib and said inside terminal, a second panel integrally joined to said first panel, said second panel being parallel to said rib and forming a longitudinal passage therebetween, said inside terminal being a shaped and relieved leaf spring flexibly disposed at a slight angle from said outside terminal,

a spring located between said first panel and said rib to bias said inside terminal toward said ouside terminal, and



an expandable tube located in said longitudinal passage to move said housing against the bias of said spring thereby relieving the tension on said inside terminal.

4,220,390

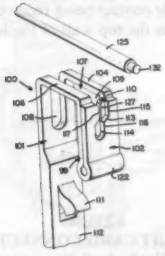
TERMINATING MEANS FOR TERMINATING MORE THAN ONE WIRE IN A SINGLE SLOTTED TERMINAL

Robert F. Cobaugh, Elizabethtown, and Norwood C. Graeff, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 831,445, Sep. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 744,003, Nov. 22, 1976, abandoned. This application Jul. 25, 1978, Ser. No. 927,719

Int. Cl.[3] H01R *13/38*

U.S. Cl. 339—97 R **9 Claims**



1. A double plate electrical terminal having wire-receiving slots cooperating to form a wire-receiving opening passing through both plates, the opening being divided lengthwise into sections, each wedgingly receiving therein and thereby electrically connecting therein a separate electrical wire, the presence of a wire in any one of said sections causing increased wedging pressure of each remaining section on a corresponding wedgingly received wire, the combination comprising:

a strip of metal folded back on itself along a bight to provide a pair of closely adjacent plates integrally joined to each other by said bight,

each said plate having an elongated slot defined between elongated first and second slot edges,

the slots of both plates cooperating to form a common wire-receiving opening passing through both plates,

said first slot edges of both plates projecting along opposite sides of said opening and being adapted for wedgingly engaging therebetween a first wire projecting through said wire-receiving opening at a first section thereof,

said second slot edges of both plates being disposed on opposite sides of said opening and adapted for wedgingly engaging therebetween a second wire projecting through said wire-receiving opening at a second section thereof which is in succession with and in communication with said first section,

said second slot edges at said second section projecting further into said wire-receiving opening than said first slot edges, the presence of a wire wedgingly in either of said sections tending to bias apart the corresponding projecting slot edges and thereby cause both plates to flex pivotally about said common bight in opposite directions laterally of each other, thereby tending to close pivotally together the projecting slot edges of the remainder of said sections on a corresponding wedgingly received wire.

4,220,391

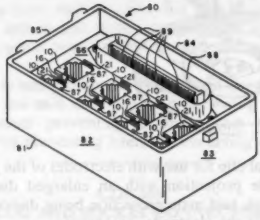
CONNECTOR ADAPTER CONSTRUCTIONS WITH IMPROVED CONNECTOR AND CONNECTOR MOUNTING ARRANGEMENT

Ronald F. Krolak, North Riverside, and Frederick J. Radloff, Northlake, both of Ill., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 770,805, Feb. 22, 1977, Pat. No. 4,103,985. This application Feb. 23, 1978, Ser. No. 880,671

Int. Cl.[2] H02G *1/08*; H04M *9/00*

U.S. Cl. 339—126 R **29 Claims**



9. An electrical connector assembly comprising:

a support member including at least one aperture, each said aperture being defined by at least a first pair of oppositely facing deformable sidewalls;

at least one connector each including a housing defining a cavity for receiving a mating electrical connector and having a second pair of oppositely facing deformable sidewalls defining a forward portion, each said connector having an outside dimension substantially corresponding to the dimension of one said aperture; and

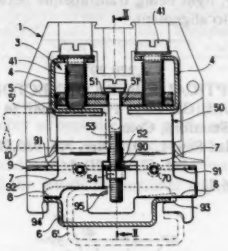
locking means carried by each said connector for deforming at least one of said deformable sidewalls upon insertion of said forward portion into said aperture and for locking said connector in place within one said aperture upon reformation of said deformable sidewall, said locking means including a shoulder portion projecting outwardly from said housing of said one connector over the edge of said aperture for limiting the insertion of said forward portion in said aperture and a boss projecting outwardly from each said connector sidewall of said second pair and forwardly axially spaced relative to said shoulder portion.

4,220,392

TERMINAL BLOCK FOR GROUND CONDUCTORS

Jean Debaigt, Maisons Laffitte, France, assignor to Société Anonyme dite: CGEE ALSTHOM, Levallois Perret, France

Filed Jan. 24, 1979, Ser. No. 6,160
Claims priority, application France, Feb. 7, 1978, 78 03344
Int. Cl.[3] H01R *7/18, 9/18*
U.S. Cl. 339—198 N 3 Claims



1. A ground conductor terminal block for grounding a conductor to a metal section bar, said bar including laterally opposed edges, said terminal block including an insulating housing, a tunnel type connector within said housing, said connector including contact shoes for overlying contact with said bar at said edges, a clamping clip for engaging said bar on the side of said bar opposite said contact shoes, and bolt and nut means for engaging said connector to said clamping clip to lock said connector and said clip to said bar, the improvement wherein:

said clip is of inverted U-shaped cross-section and including a base,

longitudinally spaced slots within said base,

said U-shaped cross-section clip further including at least two projections remote from said base and bearing notches such that the clip engages the opposite side of said metal section bar at said edges,

said connector being formed in two parts each of which includes a longitudinal flat portion, said flat portions being disposed against each other, each flat portion including a pair of contact shoe portions, which define said contact shoes, the contact shoe of one flat portion being in juxtaposition with the contact shoe of the other flat portion, said contact shoes projecting through respective slots within the base of said clip,

and said parts being crimped together at said flat portions to permit said contact shoes to pass freely through said slots while allowing rapid and reliable mechanical coupling between the longitudinal flat portions of said connector.

4,220,393

ELECTRICAL CONNECTOR AND METHOD OF FABRICATION AND ASSEMBLY

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Claude Rodriguez, Carrollton, all of Tex., assignors to Elfab Corporation, Dallas, Tex.

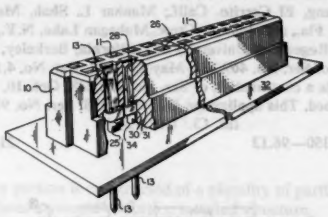
Continuation of Ser. No. 597,751, Jul. 21, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,578
Int. Cl.[3] H01R *13/46;* H05K *1/12*
U.S. Cl. 339—221 M 20 Claims

1. An electrical connector comprising:

a mounting substrate having contact receiving apertures therein, said apertures forming arrays lying along linear paths;

an insulative housing having a plurality of sleeves formed therethrough in spaced alignment with said apertures, each of said sleeves being constructed with a lower portion which undercuts an upper portion to define a generally transversely extending insertion load bearing shoulder therebetween for transmitting a press fitting force from said housing to each contact; and

contacts received into said sleeves through the lower portion thereof, said contacts each including an upper mating portion and an intermediate, generally transversely extending insertion load bearing collar portion which abuttingly engages said shoulder within said sleeve for receiving a press fitting force from said housing, said contacts



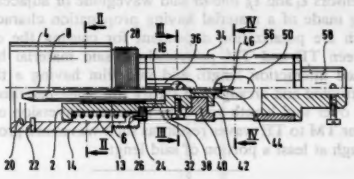
also having a press fit shank portion extending downwardly from said collar through said apertures and in interfering engagement therewith for securing said contacts tight and motionless therein and permitting said insulative housing to be removed from said contacts while said contacts remain rigidly mounted in said substrate.

4,220,394

OPTICAL FIBRE CONNECTOR

André Tardy, St. Germain les Arpajon, France, assignor to Société Anonyme dite: Compagnie Generale d'Electricite, Paris, France

Filed Jun. 16, 1978, Ser. No. 916,385
Claims priority, application France, Jun. 22, 1977, 77 19084
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 10 Claims



1. An optical fibre connector including:

a connecting part provided with holding means for holding a short optical segment fibre of a predetermined diameter and having a front end and a rear end and for guiding to align the held segment fibre with another optical segment fibre held by another optical fibre connector, and to bring the front ends of these two segment fibres into contact with each other to provide an optical connection between these two segment fibres; and

a gripping part integral with said connecting part and comprising gripping means behind the holding means relative to said segment fibre front end for fixing a front end portion of a long optical transmission fibre of non-precisely predetermined diameter and of longer length than said segment fibre behind and in alignment with said segment fibre so as to avoid any stress on the transmission fibre in front of the gripping means when a force is exerted on the transmission fibre behind the gripping means;

and an intermediate part between said connecting and gripping parts for making the connecting part integral with the gripping part, said intermediate part having at least one opening which allows access to a zone of contact between the rear end of said held segment fibre and the front end of said transmission fibre, and said opening being sufficiently wide to allow welding through it to provide

optical continuity between the rear end of the held segment fibre and the front end of the transmission fibre.

4,220,395

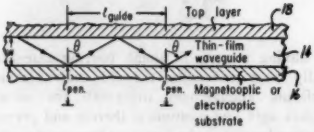
POLARIZATION CONVERTER AND CIRCUIT ELEMENTS FOR USE IN OPTICAL WAVEGUIDES

Shyh Wang, El Cerrito, Calif.; Manhar L. Shah, Melbourne Beach, Fla., and John D. Crow, Mohegan Lake, N.Y., assignors to Regents of University of California, Berkeley, Calif.

Division of Ser. No. 469,220, May 13, 1974, Pat. No. 4,153,328, which is a continuation of Ser. No. 296,238, Oct. 10, 1972, abandoned. This application Oct. 17, 1978, Ser. No. 952,105

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.12 **21 Claims**



1. Polarization converter for use in optical waveguide systems, a first layer serving as a substrate and support for said converter and having a predetermined permittivity tensor $\overleftrightarrow{\epsilon_s}$ means forming a thin film optical waveguide disposed in intimate contact on said first layer and having a permittivity tensor $\overleftrightarrow{\epsilon_f}$ means forming a top layer disposed on the other side of the said thin film optical waveguide and having a predetermined permittivity tensor $\overleftrightarrow{\epsilon_t}$, said permittivity tensor $\overleftrightarrow{\epsilon_f}$ having certain diagonal elements which control the propagation of a particular wave, said diagonal elements being selected to be greater than the corresponding diagonal elements of permittivity tensors $\overleftrightarrow{\epsilon_t}$ and $\overleftrightarrow{\epsilon_s}$ one of said waveguide or adjacent layers being made of a material having propagation characteristics which are polarization dependent for causing the coupling between TE and TM polarizations, said material having a defined interaction length and said film having a thickness constructed and arranged to satisfy the phase-matched conditions over said length and cummulative conversion of TE to TM or TM to TE waves results as such waves are propagated through at least a portion of said length.

4,220,396

FIBER OPTIC SWITCH

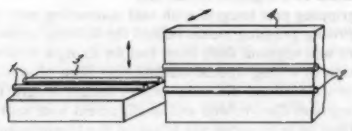
George R. Antell, Saffron Walden, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 10, 1978, Ser. No. 894,798

Claims priority, application United Kingdom, Apr. 14, 1977, 15529/77

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.15 **9 Claims**



1. A switching arrangement for optical fibers, which includes a first member which carries one or more optical fibres, having end portions disposed in a first plane and terminated at one edge of the first member, a second member which carries a plurality of optical fibres having end portions disposed in a second plane and terminated at one edge of the second member, support means for said first and second members whereby the edges thereof are closely adjacent to each other, the end portions of the optical fibers are substantially parallel and the first and second planes are substantially at 90° to each other, and means associated with each of said first and second members for producing movement of the one edges of said first and second members in first and second directions respectively, said first and second directions being substantially perpendicular so that an optical fibre on said first member can be set into end-on alignment with any one of selected optical fibers on the second member, light being transmissible between two fibres thus brought into alignment.

4,220,397

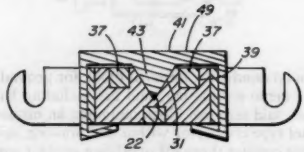
OPTICAL FIBER CONNECTOR

John E. Benasutti, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 1, 1978, Ser. No. 939,083

Int. Cl.² G02B 5/14

U.S. Cl. 350—96.21 **14 Claims**



1. A connector for holding a pair of optical fibers in axial alignment along an axial direction with the ends of the optical fibers in end relationship comprising a pair of fiber supporting members, each member having at lease one axially aligned inclined V-shaped channel for accommodating the fiber, means for holding said fibers with the ends thereof projecting a predetermined distance from the end of a respective inclined V-shaped channel, a separate fiber receiving member having a fiber junction region including at least one V-shaped channel of sufficient length having a level section at the junction region for supporting said projecting fibers in end to end relationship, said respective inclined V-shaped channels of said supporting members being inclined downwardly along an axial direction toward said junction region for urging the fibers downwardly into the level section, said receiving member having a receptacle portion, each of said supporting members having an end surface and a pair of prongs protruding outwardly therefrom in an axial direction, said respective prongs of one supporting member being in abutting relationship within said receptacle with respective prongs of the other supporting member whereby said supporting members are positioned in opposed assembled relationship to said fiber receiving member with said respective inclined channels being aligned with said level section of said channel on either side thereof, and a transversely displaceable means for engaging respective fibers within said level section of said V-shaped channel.

4,220,398

JEWELED OPTICAL FIBER CONNECTOR

David G. Dalgoutte, Ilkley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,638

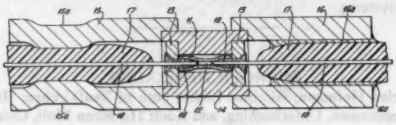
Claims priority, application United Kingdom, Dec. 22, 1977, 53435/77

Int. Cl.² G01B 5/14

U.S. Cl. 350—96.21 **10 Claims**

1. An optical fibre coupler for coupling a pair of plastics sheathed optical fibres, the coupler including a glass sleeve retained within the central region of a tubular member wherein the sleeve has a bore that at its ends is a clearance fit around the optical fibres to be coupled and tapers inwardly to a link piece of glass optical fibre that has the same cross-section as that of said fibres around and onto which the wall of the glass sleeve

has been collapsed over substantially the entire length of the link piece in such a way as to leave the portions of the bore beyond the link piece ends large enough to accommodate the insertion of said fibres, wherein a pair of pierced watch jewels having apertures that are a clearance fit around the fibres and



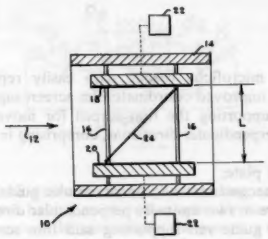
smaller than the entry apertures of the link piece are located in the tubular member at opposite ends of the sleeve with their axes aligned with the sleeve axis and with their oil cups outwardly facing, and wherein in the end regions of the tubular member beyond the jewels the member is provided with an enlarged bore.

4,220,399

NEAR MILLIMETER WAVELENGTH ELECTROMAGNETIC FILTER

Howard R. Schlossberg, 4811 Hercules Ct., Annandale, Va. 22003

Filed Nov. 13, 1978, Ser. No. 960,194
Int. Cl.² G02B *5/28*
U.S. Cl. 350—163 **10 Claims**



1. An electromagnetic filter assembly which is operable in conjunction with a beam of radiant energy having a wide band of wavelengths comprising at least two highly reflective surfaces, each of said highly reflective surfaces being in optical alignment with each other, said reflective surfaces being spaced apart a distance equal to an integer number times half a preselected wavelength of said wavelengths of said beam of radiant energy thereby achieving a resonant condition and means in optical alignment with said beam of radiant energy and said reflective surfaces for directing in a predetermined direction substantially all of said preselected wavelengths of said beam of radiant energy when said resonant condition is achieved thereby removing substantially all of said preselected wavelength from said beam of radiant energy.

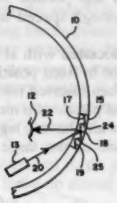
4,220,400

DISPLAY APPARATUS WITH REFLECTIVE SEPARATED STRUCTURE

Richard P. Vizenor, Maple Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1977, Ser. No. 770,560
Int. Cl.² G02B *5/10, 27/10*
U.S. Cl. 350—174 **10 Claims**

1. Helmet mounted display apparatus including a visor which has a partly reflective portion for reflecting radiation from an image source to the eye of a viewer wherein the partly



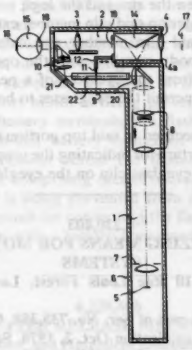
reflective portion is constructed of a plurality of partly reflective surfaces arranged to form a serrated structure.

4,220,401

HAND-HELD OPHTHALMOSCOPE

Franz Muchel, Königsbronn, Fed. Rep. of Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,690
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716615
Int. Cl.² A61B *3/10*
U.S. Cl. 351—13 **7 Claims**



1. An ophthalmoscope comprising a hollow handle part and a hollow head part, illuminating means at least partly in the handle part, and an imaging lens system in the head part, said imaging lens system including a first optical system (3) for producing an image of the fundus of an eye being examined and a second optical system (4) axially displaceable for focussing the image of the fundus at infinity, an image erecting prism arranged in front of said second optical system and operatively connected therewith, and a test mark operatively connected with said prism.

4,220,402

TRIAL LENS EYEGLASS CLIP

Gilbert G. Jannelli, c/o St. Luke's Eye Clinic, Aspen and High, New Port Richey, Fla. 33552

Filed Jan. 3, 1978, Ser. No. 866,544
Int. Cl.² A61B *3/04, 3/10*
U.S. Cl. 351—22 **6 Claims**

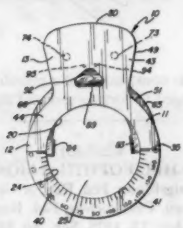
1. An eyeglass clip for holding trial lenses in selected alignment with an eyeglass lens and being adapted to be attached to a pair of eyeglasses, comprising:

a body member having a top portion and a bottom portion defining a rim with a relatively large aperture and a lens holder generally forward and below the aperture, said lens

holder extending forwardly from said rim and defining a generally semicylindrical channel with at least three axially spaced grooves formed therein adapted to receive trial lenses, said top portion having a relatively small aperture therethrough spaced upwardly from said large aperture;

retaining means associated with at least one of said grooves to hold a trial lens in fixed position against one axial face of the groove when inserted into the associated groove;

an integrally formed plastic clip member secured to the rear of the top portion and having legs extending downwardly one on either side of the large aperture with the ends



thereof adjacent the rear of said rim, the inherent resiliency of said clip member biasing said legs forwardly toward said rim to grip the lens of a pair of eyeglasses placed between the rim and the legs;

an operating finger on said clip member extending upwardly away from said clip member and extending forwardly toward said body member with the operating finger directed away from the eyebrow of a person wearing the eyeglasses to permit the eyeglasses to be moved closer to the eye; and

leveling means secured to said top portion in alignment with said small aperture for indicating the proper angular orientation of said eyeglass clip on the eyeglasses.

4,220,403

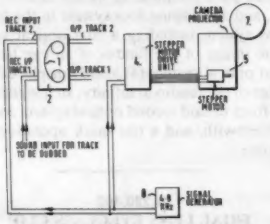
SYNCHRONIZING MEANS FOR MOTOR-DRIVE SYSTEMS

Francis Chauvet, 10 Rue Louis Forest, Louviennes, Paris, France

Continuation-in-part of Ser. No. 735,358, Oct. 26, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 948,056

Int. Cl.[2] G03B *31/00*

U.S. Cl. 352—17 **7 Claims**



1. An apparatus for synchronizing two or more motor driven systems comprising a tape having recorded thereon a sine wave signal, means for driving said tape from one of said systems, means for obtaining a sine wave signal from the recording on said tape as said tape is driven, a stepper motor included in another said motor driven system, means for converting said sine wave signal to provide a pulse source for said stepper motor and for applying pulses therefrom to drive said stepper motor, said last named means including storage means arranged to accept input pulse signals derived from said sine wave signal and deliver an output of pulses at a rate acceptable to said stepper motor during starting, running and stopping of said motor driven systems, and said storage means being further operative to relate the number of pulses supplied to drive said stepper motor to the number of pulses derived from said sine wave signal whereby to maintain synchronism between said systems.

4,220,404

MICROFICHE READER

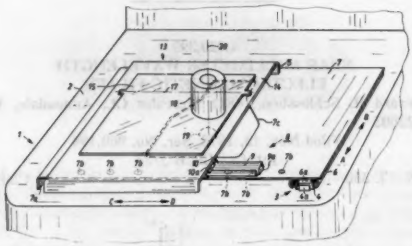
Wilfried Hofmann; Günther Lüder, both of Taufkirchen; Ruth Oppermann, Unterhaching, and Adolf Hermann Moll, Geiselbullach, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG., Munich, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 938,945

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1977, 7727582[U]

Int. Cl.[2] G03B *23/08*

U.S. Cl. 353—27 R **7 Claims**



1. In a microfiche reader with easily replaceable film screens, an improved coordinate film screen support arrangement for supporting the film screen for movement in two mutually perpendicular directions, comprising in combination,

a base;

a support plate;

first and second mutually perpendicular guide rails adapted to move in two mutually perpendicular directions,

said first guide rail supporting said film screen and said second guide rail supporting said support plate;

said second guide rail being operatively mounted on said base and said first guide rail being connected to said support plate, so that upon the application of a predetermined force said first guide rail can be manually separated from said support plate and replaced by a different guide rail and film screen supported thereby without the necessity of using any tools.

4,220,405

CAMERA SETTING DEVICE

Otto Stemme, Munich; Peter Lermann, P. Feldkirchen; Karl Wagner, Munich, and Dieter Engelsmann, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Feb. 7, 1979, Ser. No. 10,017

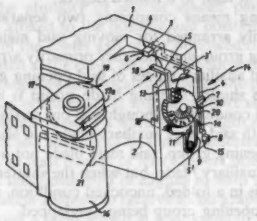
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805515

Int. Cl.[2] G03B *7/24, 17/26*

U.S. Cl. 354—21 **5 Claims**

1. In a camera, a combination comprising a housing having a chamber for a film container; manually operable means movable to any of a plurality of positions for manually setting at least one camera function in dependence upon a characteristic of film being used in the camera; arresting means for arresting the manually operable means in the respectively set positions; scanning a means for scanning a film container introduced into the camera to determine the presence or absence of a film-

characteristic mark on the container; and combined means for disengaging said arresting means and for thereupon mechanically operating said manually operable means, in response to



detection of the presence of a film-characteristic mark on the container and as a function of the characteristic indicated by the detected mark.

4,220,406

OPTICAL ELECTRONIC FOCUSING DEVICE

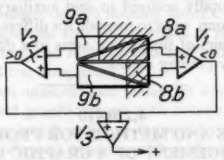
Klaus-Dieter Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 11, 1978, Ser. No. 968,133

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756954

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—25 **7 Claims**



1. An optical electronic device for focusing as in a photographic camera having an objective optical system producing two split images of the same object the contours of which are laterally offset with respect to each other upon defocusing and a photoelectric receiver device for receiving said offset images, said receiver device comprising a first pair of individual photoelectric receivers (*8a, 8b*), upon each of which one of the images of the object is incident, said individual receivers having approximately equal receiving areas which uniformly increase laterally from one side to the other, said individual receivers providing electrical output signals and said optical electronic device further comprising means for receiving said electrical output signals.

4,220,407

CAMERA WITH FILM TRANSPORT MOTOR POWERED BY BATTERY WHICH ALSO CHARGES A FLASH UNIT DURING INTERVALS OF TRANSPORT MOTOR INOPERATIVENESS

Otto Stemme; Karl Wagner, both of Munich; Peter Lermann, Narring; Rolf Schröder, Baldham, and Peter Utschig, Unterhaching, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

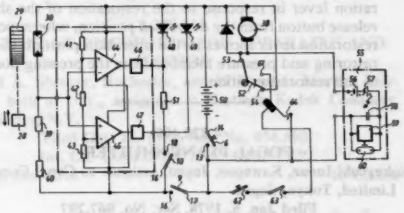
Filed Mar. 14, 1979, Ser. No. 20,331

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1978, 2841649

Int. Cl.[2] G03B *1/18, 15/05, 17/18, 17/38*

U.S. Cl. 354—126 **6 Claims**

1. In a photographic camera of the type provided with an electric film transport motor, battery terminals for electrical connection to a camera battery and flash-unit terminals for electrical connection to an electronic flash unit, a novel energization-control arrangement which comprises switching means operative for alternatively preventing and not preventing the film transport motor from drawing energy off the battery terminals, operative when the motor is not thusly prevented for furthermore preventing the flash-unit terminals from drawing energy off the battery terminals, but not preventing the flash-unit terminals from drawing energy off the battery terminals when the film transport motor is being prevented from drawing energy off the battery terminals; an electronic flash unit having input terminals connected to respective ones of the flash-unit terminals, the flash unit including an energy-storing element which, when permitted to do so, draws energy from the battery terminals to build up stored energy in preparation



for an electronic flash, the switch means preventing the energy-storing element from building up stored energy drawn off the battery terminals when the transport motor is not being prevented from drawing energy off the battery terminals, but the switch means not preventing the energy-storing element from building up stored energy drawn off the battery terminals when the transport motor is being prevented from drawing energy off the battery terminals; the flash unit furthermore including a flash-unit battery connected in series with the energy-storing element across the flash-unit terminals, the switching means comprising means operative when the film transport motor is being prevented from drawing energy off said battery terminals for connecting the flash-unit battery into series connection with a battery connected to the battery terminals.

4,220,408

SHUTTER RELEASE MECHANISM

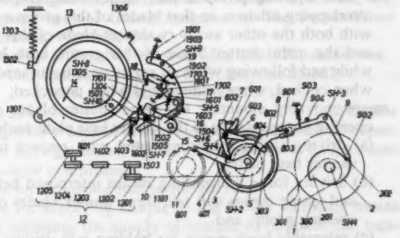
Fujio Kodaka, Soka, and Hidemichi Oonuma, Kasukabe, both of Japan, assignors to Kabushiki Kaisha Doi, Fukuoka, Japan

Filed Jul. 19, 1979, Ser. No. 58,896

Claims priority, application Japan, Jul. 19, 1978, 53-99347[U]

Int. Cl.[2] G03B *1/00, 9/28, 17/04, 17/38*

U.S. Cl. 354—187 **8 Claims**



1. A shutter release mechanism for a camera comprising a shutter, a shutter release member to actuate the shutter, a shutter release button and a shutter speed setting means, which comprises:

a pressure member movable between a pressing position and

a restored position and adapted to actuate the shutter release member;

a first hook member adapted to hook the pressure member at the restored position;

a restoration lever movable between an operation position and an initial position and adapted to restore said pressure member from the pressing position to the restored position; and

a second hook member adapted to hook the restoration lever at the initial position;

said first hook member being adapted to release the pressure member in response to the depression of the shutter release button, whereupon the pressure member moves to the pressing position thereby actuating the shutter release member; and

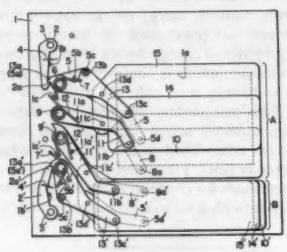
said second hook member being adapted to release the restoration lever in response to the restoration of the shutter release button from the depressed position, whereupon the restoration lever moves to the operation position thereby restoring said pressure member from the pressing position to the restored position.

4,220,409

FOCAL PLANE SHUTTER

Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jan. 5, 1978, Ser. No. 867,297
Claims priority, application Japan, Jan. 11, 1977, 52-1653
Int. Cl.[2] G03B 9/40
U.S. Cl. 354—247 **10 Claims**



1. A shutter opening blade group assembly for a focal plane shutter for a camera which includes an exposure aperture and a shutter base plate, comprising:

three opening group shutter blades disposed in overlapping relation, and including one main shutter blade having an opening edge for an exposure slit to traverse the exposure aperture as an exposure is made, and two auxiliary blades for cooperating with the main shutter blade to fully obscure the exposure aperture until the exposure is begun;

the three opening group shutter blades being disposed in overlapping relation, so that blades of this group overlap with both the other auxiliary shutter blade of this group and the main shutter blade of this group, both before, while and following when an exposure is being made, i.e. when cocked, when folding, and when uncocked;

means movably mounting the three shutter blades of the opening group relative to the shutter base plate, including:

(a) driving spring means mounted with respect to said shutter base plate;

(b) driving force transmitting means interposed between said spring means and said three shutter blades of said opening group; and

(c) releasable hook means for holding said driving force transmitting means against movement and said spring means cocked until said hook means is released;

the driving force transmitting means for the auxiliary shutter blades of the opening group being movable independently of the driving force transmitting means for the main shutter blade of the opening group, at least to a limited degree, so that during folding of the opening group, the spring means may move the main shutter blade of the opening group independently of the auxiliary blades of the opening group, at least to a limited degree;

said spring means comprising two separate springs, one primarily arranged for moving said main blade of said opening group and the other primarily arranged for moving said auxiliary blades of said opening group;

when the shutter opening blade group is in a developed, cocked condition, although said one auxiliary blade overlaps both said other auxiliary blade and said main blade of said opening group, said main blade not overlapping said other auxiliary blade, but when the shutter opening blade group is in a folded, uncocked condition, all three blades of the opening group being overlapped;

the driving force transmitting means for the main blade of the opening group comprises a first pair of laterally spaced supporting arms pivotally secured towards respective one ends thereof on the shutter base plate and pivotally secured towards respective other ends thereof to the main blade of said opening group generally parallelogram fashion; and

the driving force transmitting means for the auxiliary blades of the opening group comprises a second pair of laterally spaced supporting arms pivotally secured towards respective one ends thereof on the shutter base plate and pivotally secured toward respective other ends thereof to each of said auxiliary blades of said opening group generally parallelogram fashion; and

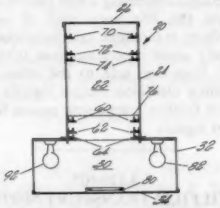
further including means loosely pinning at least one said supporting arm that is pivotally secured to said main blade of said opening group to at least one said supporting arm that is pivotally secured to said auxiliary blades of said opening group, so as to provide for differential pivoting of said two pairs of supporting arms to a degree limited by said loosely pinning means.

4,220,410

APPARATUS AND METHOD FOR PRODUCING AN ENLARGEMENT OF A GRAPHIC IMAGE

David L. Bloodgood, 26 W. Micheltorena St., Santa Barbara, Calif. 93101

Filed Jan. 15, 1979, Ser. No. 3,717
Int. Cl.[2] G03B 27/52
U.S. Cl. 355—18 **8 Claims**



1. Apparatus for producing an enlargement of a graphic image comprising

a light tight housing having an extended hollowed out central area and at least one opening from the exterior of the housing into said hollowed out central area, said housing including a door for providing access to said hollowed out central area and means for covering the edge of said door to make the hollowed out central area light tight;

a platen adapted to receive and position a graphic image to be enlarged at a predetermined location along the center axis of and at one end of said hollowed out area;

a plurality of sets of parallel spaced lens support slots affixed to the housing and positioned one slot of each pair of each

side of the center axis of the hollowed out area and located a preselected distance from said platen;

a plurality of sets of parallel spaced support slots equal in number to the plurality of sets of spaced parallel lens support slots affixed to the housing and position one slot on each side of the center axis of the hollowed out central area and located at the other end of the hollowed out area with the lens support slots located between the platen and at least one set of the parallel spaced support slots;

a planar lens support having a fixed focal length lens at the center thereof and adapted to be slidably inserted into and supported by at least one set of lens support slots with the center of the lens positioned in alignment with the predetermined location adapted to receive a said graphic image, said lens having a focal length at least equal to the preselected distance between the lens support slots and the platen;

a planar matt support for receiving and positioning a strip material having a base material with a coated surface thereon, which coated surface is responsive to a selected actinic radiation, said planar matt support being adapted to be slidably inserted into and supported by at least one set of matt support slots for positioning the coated surface toward and in alignment with said lens;

light sealing means affixed to the interior of said door adjacent said plurality of parallel spaced lens support slots and affixed to the interior surface of the housing opposite to the interior of the door, said door when closed in light tight engagement with said housing urging said light sealing means into contact and light sealing engagement with the edge of the planar lens support urging the opposite edge thereof into light sealing engagement with the light sealing means on said housing interior surface forming a light tight seal around the edges of the planar lens support and between said one end and said other end of the hollowed out area; and

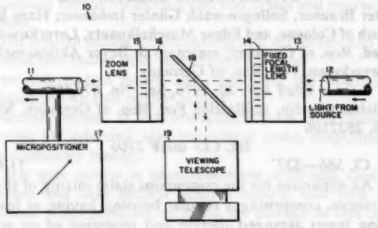
means positioned adjacent said platen for controllably illuminating a said graphic image with actinic radiation at a selected wave length which is focused by said lens onto the coated surface to produce with said actinic radiation an exposed enlarged graphic image on said coated surface of the graphic image positioned on the predetermined location in the platen.

4,220,411

FIBER OPTIC LIGHT LAUNCHING ASSEMBLY

Steven J. Cowen, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1978, Ser. No. 933,304
Int. Cl.[3] G01N *21/00*
U.S. Cl. 356—73.1 **10 Claims**



1. Apparatus for providing a condition of equilibrium at the launching end of a selected optic fiber, said apparatus comprising:

an apertured source of light;

means for positioning said launching end of said selected optic fiber so that a beam of light projected by said light source impinges upon said launching end;

multiparameter adjustment means lying on the path of said projected light beam for enabling an operator to adjust the diameter and numerical aperture, over respective selected ranges, of a spot of light projected onto said launching end by said light beam; and

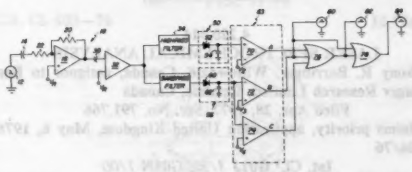
means for enabling said operator to view said light spot as the diameter and numerical aperture of said light spot are adjusted by means of said multiparameter adjustment means, until the diameter of said light spot is equal to the diameter of the core of said optic fiber, and the numerical aperture of said light spot matches the numerical aperture of said optic fiber.

4,220,412

ILLUMINANT DISCRIMINATION APPARATUS AND METHOD

Richard A. Shroyer, Rochester, and William A. Martin, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,690
Int. Cl.[2] G01J *3/34, 1/42;* G03B *7/00*
U.S. Cl. 356—218 **10 Claims**



1. Illuminant discrimination apparatus for discriminating incandescent light from a mixture of daylight and fluorescent light, such incandescent and fluorescent light varying in intensity at a fundamental frequency, said apparatus comprising:

(a) light-sensitive means responsive to incident light for producing a first signal proportional to the instantaneous intensity of said incident light;

(b) circuit means for producing a second signal proportional to the amount of harmonic distortion in said first signal; and

(c) means responsive to said second signal for producing a signal indicative of the type of light incident on said light-sensitive means.

4,220,413

AUTOMATIC GAS FLOW CONTROL APPARATUS FOR AN ATOMIC ABSORPTION SPECTROMETER BURNER

Roger W. Targowski, Fairfield, and Chester G. Fisher, III, Southport, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Continuation of Ser. No. 907,449, May 22, 1978, abandoned. This application May 3, 1979, Ser. No. 35,583
Int. Cl.[2] G01J *3/30;* F23N *3/08*
U.S. Cl. 356—315 **12 Claims**

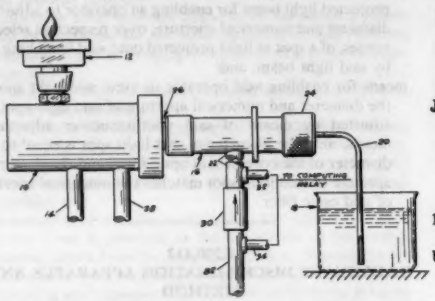
1. A gas flow control system for an atomic absorption spectrometer having a burner for burning a mixture of fuel, oxidant and a sample comprising:

means for supplying fuel to the burner,

means for supplying sample to the burner including means for adjusting the supply of sample to optimize the measured signal of the spectrometer and first means for supplying oxidant to the burner, the supply of oxidant to the burner through said first means being adjustable in accordance with the adjustment to said sample adjustment means,

second means for providing an adjustable supply of oxidant to the burner, the total supply of oxidant to the burner

being equal to the sum of the oxidant supplied to the burner by said first and second oxidant supply means, and



means for adjusting said second oxidant supply means in response to an adjustment of said sample flow means to maintain the total oxidant supplied to the burner substantially constant.

4,220,414

LASER SPECTROCHEMICAL ANALYSIS

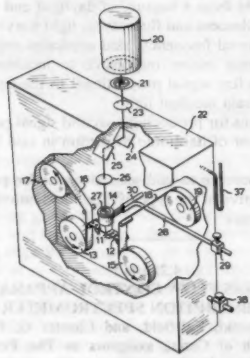
Anthony R. Barringer, Willowdale, Canada, assignor to Barringer Research Limited, Rexdale, Canada

Filed Apr. 28, 1977, Ser. No. 791,766

Claims priority, application United Kingdom, May 6, 1976, 18536/76

Int. Cl.³ G01J *3/30*; G01N *1/00*

U.S. Cl. 356—318 **8 Claims**



1. A method of analyzing samples of material for predetermined chemical parameters comprising:

(a) depositing a sample of said material in a thin layer on a substrate, said substrate having an adhesive coating to which such material adheres,

(b) irradiating said sample with a laser beam focused on said sample at a region where vapourization of said sample occurs, the wavelength and intensity of said laser beam and the thickness of said sample being such that at least a portion of said sample is vapourized by said laser beam, said laser wavelength being selected so that a substantial portion of the energy of the laser beam is absorbed by said sample and substantially none of said laser energy is absorbed by said substrate or by said adhesive, so that said substrate and said adhesive are substantially non-absorbent of energy at the wavelength of said laser beam, whereby said portion of said sample may be vapourized without vapourizing said substrate or said adhesive, and

(c) analyzing the vapourized sample for said predetermined chemical parameters.

4,220,415

CONSTRUCTION FOR PHOTOMETRIC ANALYZER

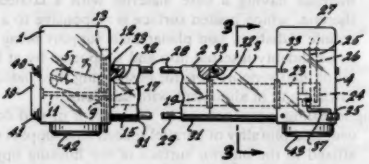
Joachim Staab; Willy Apel, both of Frankfurt, and Heinz Wolf, Kronberg, all of Fed. Rep. of Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 955,095

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749662

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—433 **4 Claims**



1. Photometric analyzer construction, comprising:

a first unit of block construction containing at least one source of radiation, at least one radiation duct with an exit adjacent to or in said face and a movable modulating diaphragm, said block having additionally two parallel, traversing bores;

a second unit of block construction containing at least one radiation absorption detector and means for converting absorbed radiation into an electrical signal, the second unit also having two parallel bores;

a pair of rods, respectively, inserted into one bore each of sad first and second units and optically aligning them with regard to emitted and detected radiation;

means for fastening the rods to the units to, thereby, interconnect them; and

at least one intermediate unit containing at least one gas cell and having notches for being suspended by the rods as extending between the first and second units, thereby spacing the first and second units, said fastening means holding the units together in abutting relationship.

4,220,416

APPARATUS FOR THE CONTINUOUS STATIC MIXING OF FLOWABLE SUBSTANCES

Dieter Brauner, Solingen-wald; Günter Imhäuser; Hans Kaluza, both of Cologne, and Edgar Muschelknautz, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellshaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1976, Ser. No. 679,113

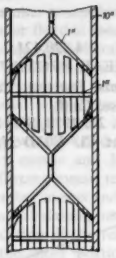
Claims priority, application Fed. Rep. of Germany, May 17, 1975, 2522106

Int. Cl.² B01F *5/06*

U.S. Cl. 366—337 **11 Claims**

1. An apparatus for the continuous static mixing of flowable substances, comprising a tubular housing having at least one mixing insert arranged therein and receptive of an arriving stream of flowable substance to guide the stream parallel to the axis of the housing to and through the mixing inserts, each mixing insert comprising two planar portions disposed at an acute angle to the housing and intersecting and joined in a common connecting web extending transversely across the housing, wherein each of said planar portions extends over the

cross-section of the housing limited only by the connecting web and the wall of the housing and each planar portion comprises a plurality of webs arranged in its corresponding plane and a slot located between adjacent webs in the same plane.



4,220,417

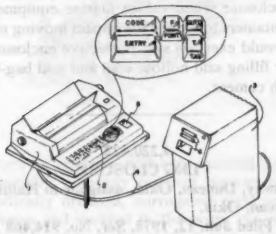
APPARATUS FOR PRODUCING PRELIMINARY CHARACTER PRINTOUT OF TEXT AND INSTRUCTION CODES OF WORD PROCESSING APPARATUS

Charles N. Sprott, and Leonard S. Yates, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 883,443, Mar. 6, 1978, abandoned. This application Jun. 8, 1978, Ser. No. 913,617

Int. Cl.³ B41J *5/30*

U.S. Cl. 400—70 **9 Claims**



1. Word processing apparatus, comprising:

(a) an output printer,

(b) input keyboard means for generating text codes representative of text to be printed by said output printer and instruction codes representative of the format by which said text is to be printed,

(c) memory means for storing said text codes and instruction codes,

(d) first control means for outputting said text codes and said instruction codes from said memory means,

(e) second control means for controlling the printing of characters by said output printer,

(f) decode means in communication with said memory means for selecting said instruction codes outputted by said memory means,

(g) first gate means in communication with said memory means and said second control means, said first gate means, when actuated, enabling the passage of text codes from said memory means to said second control means, thereby to actuate said printer to print a set of text characters corresponding to said text codes,

(h) character generator means in communication with said decode means for generating audit print character codes representative of selected ones of said instruction codes outputted from said memory means, said audit print character codes being substituted for printer execution of said instruction codes,

(i) second gate means communicating with said character generator means and said second control means, said second gate means, when actuated, enabling the passage of said audit print character codes to said second control means, thereby to cause said printer to print a set of audit print characters corresponding to said audit print character codes, and

(j) third means for selectively and alternately actuating said first gate means to pass said text codes to said second control means and said second gate means to pass said audit print character codes to said second control means to produce printed lines of intermixed ones of said text and audit print characters.

4,220,418

SUSPENSION BALL JOINT MOUNTING MECHANISM

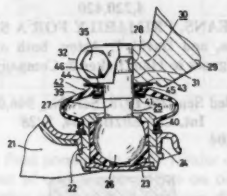
Takeo Kondo, and Yutaka Inuzuka, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Oct. 31, 1978, Ser. No. 956,984

Claims priority, application Japan, May 16, 1978, 53/64607[U]

Int. Cl.² F16C *11/06*

U.S. Cl. 403—76 **12 Claims**



1. In a suspension ball joint mounting mechanismin which a ball portion of a ball joint stud assembly is pivotally supported to a support seat assembly secured to a suspension arm, a stud portion thereof is engaged with a steering knuckle and a dust cover is provided between the support seat assembly and the steering knuckle, the improvement wherein an end of said steering knuckle is slitted and forms a forked clamping portion for clamping said stud portion with a bolt, said dust cover includes a lip portion and an edge ring face, and a plate washer is provided sealedly between substantially the entire area of said edge ring face and said lip portion of said duct cover and a corresponding face of said steering knuckle, said plate washer being formed with a wasped flange portion at an end thereof.

4,220,419

CONNECTOR FOR WELDED CONTINUOUS BEAM STRUCTURES

William H. Hawes, 515 Clarkson St. #407, Denver, Colo. 80218

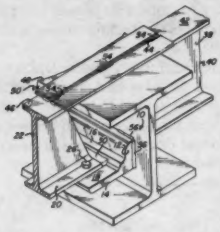
Filed May 18, 1979, Ser. No. 40,159

Int. Cl.² F16B *7/00*; F16L *41/00*

U.S. Cl. 403—189 **6 Claims**

1. In a one piece generally L-shaped connector for attachment to the web of an I-beam support between the marginal flanges bordering same as a means for attaching the bias cut end of a relatively shallower I-beam thereto in perpendicular relation, a pair of legs disposed in substantially right angled relation to one another with a longitudinally-extending step formed in the right angle therebetween, one of said legs having a flat surface on a face thereof remote from said right angle while the other of said legs has a flat surface on a face thereof adjacent said right angle, said remote flat surface including side margins and a free edge atop thereof for welding to the vertically-disposed web an I-beam support when said surface is

placed in face-to-face upstanding relation thereagainst, and said adjacent flat surface when arranged horizontally at the base of the step defining an upwardly-facing ledge adapted to support the bottom flange of a relatively shallower I-beam with a bias cut end laid atop thereof, and said step defining a



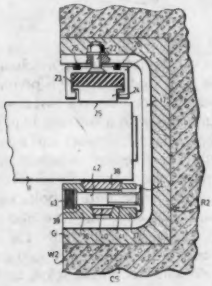
spacer effective to maintain the bias cut end of the second of said I-beams a predetermined minimum fixed distance away from said vertically-disposed web of the first to leave a gap sized to permit uninterrupted vertical placement of a full penetration butt weld between said second beam and connector at the base of said step.

4,220,420

SEALING MEANS, PRIMARILY FOR A SLUICE GATE

Raymond Aston, and David T. Aston, both of Brierley Hill, England, assignors to Ham Baker & Company Limited, Warley, England

Filed Sep. 26, 1978, Ser. No. 946,021
Int. Cl.[2] E02B *7/54, 7/28*
U.S. Cl. 405—104 **16 Claims**



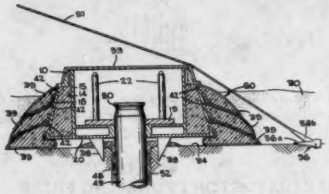
1. In a sealing arrangement comprising two sealing members having respective sealing faces the mutual contact of which provides a seal between the members, and means operative between a fixed member and one of the sealing members to urge said one member towards the other sealing member thereby to press the sealing face of said one member into sealing engagement with the sealing face of said other member, the improvement wherein said means comprises two parts which are arranged to bear against or are connected to said one sealing member and said fixed member respectively and are movable relative to one another in a first direction to urge said one sealing member towards said other sealing member, one of the two parts comprising two spaced portions having the other part disposed between them with its side faces co-operating with the opposed faces of the two portions, at least one pair of said co-operating faces being planar faces disposed at an inclination to said first direction, and adjusting means operable to apply forces to the portions in directions towards one another and perpendicular or substantially perpendicular to said first direction, the said forces acting transversely through said faces, thereby to press the two portions inwardly against the intermediate part so that the two parts are moved relative to one another in said first direction under the effect of the co-operating inclined faces.

4,220,421

SUBSEA WELLHEAD PROTECTIVE ENCLOSURE

Paul M. Thorne, Santa Barbara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 27, 1978, Ser. No. 963,730
Int. Cl.[2] E02D *31/00*
U.S. Cl. 405—211 **11 Claims**



5. Apparatus for protecting structures on the sea floor from physical damage caused by nets, anchors and other marine equipment, said apparatus comprising:

a rigid protective enclosure having a hollow wall;

a plurality of bag-like containers;

means for separately attaching each of said bag-like containers to the outside of said wall of said enclosure, said separate containers being capable of being broken away from said enclosure when subsea marine equipment snags on said containers to reduce the impact moving marine equipment would exert on said protective enclosure; and

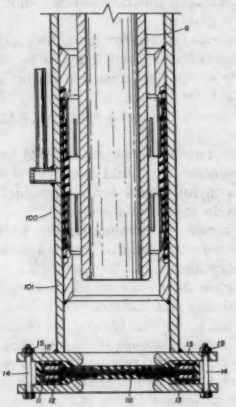
means for filling said hollow wall and said bag-like containers with cement.

4,220,422

LEG CLOSURE

Bob L. Sullaway, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 12, 1978, Ser. No. 914,468
Int. Cl.[2] B63C *23/16;* E02D *5/52*
U.S. Cl. 405—225 **12 Claims**



1. In combination, a diaphragm and annular diaphragm

retaining means retaining said diaphragm therein, wherein said diaphragm comprises:

circular flexible member means having a peripheral portion and an inner portion;

annular reinforcing member means located in the peripheral portion of said circular flexible member means;

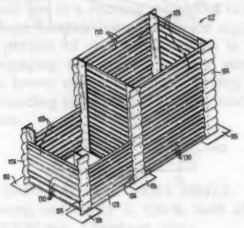
reinforcing means having a peripheral portion and an inner portion contained witnin said circular flexible member means, said reinforcing means having the inner portion thereof being disposed within the inner portion of said circular flexible member means, having the peripheral portion thereof being wrapped and secured to said annular reinforcing member means and having the peripheral portion of said reinforcing means terminating inwardly of said reinforcing member means and the inner diameter of said annular diaphragm retaining means wherein a portion of the peripheral portion of the reinforcing means overlays a portion of the inner portion of said reinforcing means.

4,220,423

HIGH STRENGTH CORRUGATED METAL PLATE AND METHOD OF FABRICATING SAME

Eugene W. Sivachenko, 6851 Waverly, Redding, Calif. 96001

Division of Ser. No. 699,289, Jun. 24, 1976, Pat. No. 4,099,359.
This application May 8, 1978, Ser. No. 904,045
Int. Cl.[2] E04D *1/00*; E02D *5/00*
U.S. Cl. 405—284 **5 Claims**



1. A structure for retaining bulk-type material comprising at least two generally vertically oriented support posts, and a generally vertically oriented, corrugated plate spanning the distance between and secured to the posts, the plate having alternating peaks and troughs oriented perpendicular to the posts, at least one of the upright posts having a generally T-shaped cross-section defined by a web and a pair of legs extending transversely from the web, the legs having an undulated configuration defined by alternating peaks and troughs, the pitch between the peaks and troughs of the leg and the spacing between a peak and an adjacent rough ot the leg being dimensioned complementarily to the correspondingly pitch and spacing of the corrugated plate.

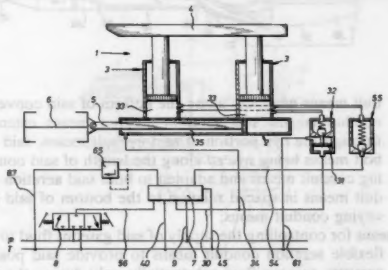
4,220,424

VALVE ARRANGEMENT FOR A WALKING MINE ROOF SUPPORT

Ernst-Günter Nerlich, Essen, Fed. Rep. of Germany, assignor to Bochumer Eisenhütte Heintzmann GmbH & Co., Bochum, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 963,959
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1977, 2755392
Int. Cl.[3] E21D *15/44*
U.S. Cl. 405—302 **8 Claims**

1. In a combination with a walking mine roof support having a plurality of hydraulically operated props each movable between an extended position by feeding pressure fluid into a cylinder space below a piston thereof and a collapsed position by discharging pressure fluid from the cylinder space and advancing means comprising a hydraulically operable cylinder-and-piston unit for advancing the mine roof support upon feeding of pressure fluid into the cylinder of said unit, a valve arrangement for automatically first moving said props to said collapsed position and advancing the mine roof support by said advancing means and thereafter moving said props to said extended position, said valve arrangement comprising first valve means movable from a starting position to a working position for discharging pressure fluid from said cylinder spaces of said props to move the latter to said collapsed position and for feeding pressure fluid from a source of pressure fluid into said cylinder of said cylinder-and-piston unit to advance said mine roof support; and second valve means for subsequently feeding pressure fluid into the cylinder spaces of said props for moving the latter to said expanded position, said second valve means comprising a stepped piston fluid-tightly guided in a cylinder bore of said second valve means and dividing the cylinder bore in two compartments, first passage means controlled by said first valve means for time-delay



transmitting the fluid pressure in said cylinder of said advancing means to one of said compartments on one side of said stepped piston after pressure fluid has been discharged from said cylinder space of said props, second passage means for transmitting the fluid pressure from said source into the other compartment to the other side of said stepped piston, a one-way valve in said second passage means, an overpressure valve connected to a return conduit and communicating with said other compartment and opening when the pressure in said other compartment surpasses the adjusted pressure of said overpressure valve causing thereby the stepped piston to move from a starting position to a second position in which fluid passes from said source to said cylinder spaces of said props, a return piston acted upon one side continuously by the fluid pressure of said source and on the other side thereof by the pressure in said cylinder spaces of said prop and cooperating with said first valve means for delaying feeding of pressure fluid from said source to said one compartment.

4,220,425

METHOD AND APPARATUS FOR ASSISTING PNEUMATIC CONVEYORS UTILIZING VACUUM

Wayne M. Jacobson, York, Nebr., assignor to Cyclonaire Corporation, Henderson, Nebr.

Filed Feb. 6, 1978, Ser. No. 875,145
Int. Cl.[2] B65C *53/26*
U.S. Cl. 406—86 **8 Claims**

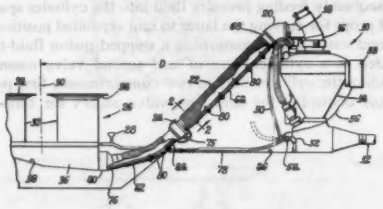
2. Apparatus for pneumatically conveying generally dry particulate matter through a conveying conduit means from a first end portion to a second end portion, said conduit means being of the type which is flexible along a significant portion of its length, comprising:

means associated with said second end portion for intermittently and cyclically applying vacuum pressure to the interior of said conveying conduit means to create a suction force for moving said particulate matter towards said second end portion of said conveying conduit means;

a flexible aeration conduit means located inside said conveying conduit means for introducing gaseous fluid under positive pressure into said particulate matter located therewithin;

said flexible aeration conduit means has an outer dimension substantially smaller than the interior dimension of said conveying conduit means; said flexible aeration conduit means has a plurality of closable apertures therein located along the length thereof;

holding means comprising eyebolt means attached to said conveying conduit means and holding said aeration conduit means generally along the bottom of said conveying conduit means, said aeration conduit means extending through the eye portion of said eyebolt means, said eyebolt means being spaced along the length of said conveying conduit means and adapted to hold said aeration conduit means in spaced relation to the bottom of said conveying conduit means;



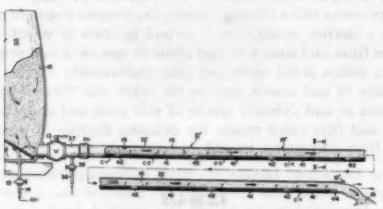
means for controlling the supply of said gaseous fluid to said flexible aeration conduit means to provide said positive pressure gaseous fluid substantially only during the time vacuum pressure is applied to said conveying conduit means.

4,220,426

TUBULAR PNEUMATIC CONVEYOR PIPELINE

Lemuel L. Ply, Rte. 1, Box 354-E, Wimberley, Tex. 78676

Filed Dec. 26, 1978, Ser. No. 973,286
Int. Cl.[3] B65G *53/18*
U.S. Cl. 406—89 **2 Claims**



1. A conveyor pipeline for conveying solid products, comprising:

(a) an outer, impervious pipe having upstream an inlet for receiving a gas-propelled, granulated solid product and for conveying same to an outlet downstream thereof;

(b) a porous, relatively-small diameter, inner pipe disposed inside and extending substantially throughout the length of said outer pipe; the inlet to the bore of the inner pipe, upstream of said pipeline, receiving pressurized gas, and the pores in the wall of said inner pipe being continuously open;

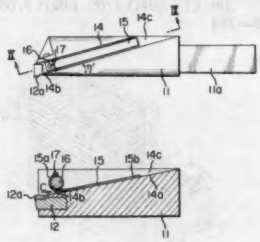
(c) a plurality of one-way, pressure-responsive valves longitudinally spaced apart inside the bore of the inner pipe, whereby each section of the bore between a pair of consecutive valves forms a chamber; each valve being normally closed and being biased to open only in the downstream direction by a predetermined pressure drop across the valve, said pressure drop being produced, in use, when the inlet to the bore of the inner pipe receives pressurized gas and product in the bore of the outer pipe builds up around the porous wall of the valve's chamber, thereby causing the back pressure on the valve to exceed the bias of the valve; said valves consecutively open at the rate determined by the product flow through the bore of said outer pipe; and each chamber as it becomes pressurized causes gas to escape through its continually open pores in the wall thereof into the bore of the outer pipe, thereby forming an air cushion under the moving product, and assisting in fluidizing the product.

4,220,427

APPARATUS FOR GUIDING CONTINUOUS CHIP FORMED IN LATHING

Keiichi Kimura, Yokohama, and Eimei Negishi, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 25, 1978, Ser. No. 872,156
Claims priority, application Japan, Jan. 31, 1977, 52-9439; Sep. 5, 1977, 52-105883; Sep. 12, 1977, 52-108964; Sep. 16, 1977, 52-110466; Sep. 20, 1977, 52-112201; Sep. 21, 1977, 52-112553
Int. Cl.[2] B26D *1/00*; B23B *27/22*
U.S. Cl. 407—3 **9 Claims**



1. Apparatus for guiding a continuous chip formed by the cutting tool of a lathe to a determined position, said cutting tool being provided with a rake face, said apparatus comprising: a tool holder, a guide member adapted to be supported on said tool holder and provided with means for guiding said continuous chip, said guiding means being provided with an inlet in the vicinity of the cutting edge of said cutting tool and with an outlet, the direction of said guiding means in the vicinity of the inlet thereof coinciding approximately with the direction of flow of said continuous chip, said guiding means comprising a groove open upwardly perpendicularly to the rake face of the cutting tool, and a resilient member disposed along said groove to cover the bottom face thereof in a manner to allow passage of a chip between said resilient member and said bottom face, said resilient member being biased toward said bottom face to prevent said chip from curling vertically upwardly.

4,220,428

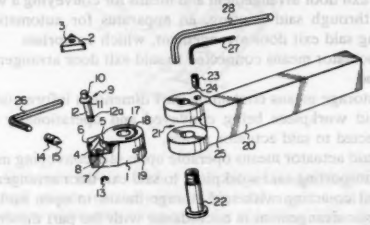
TOOL HOLDER

Masakazu Suzuki, Sowa, Japan, assignor to Suzuki Iron Works Co., Ltd., Ibaragi, Japan

Filed Jun. 15, 1978, Ser. No. 915,775
Claims priority, application Japan, Jun. 18, 1977, 52-72531
Int. Cl.[3] B26D *1/00*
U.S. Cl. 407—105 **3 Claims**

1. A tool holder for use with a tool bit having a cylindrical central hole therein, comprising; (a) a shank having a cut-out portion in the forward end thereof and having a flat surface for supporting one surface of said tool bit and an upstanding sidewall for engaging a substantial portion of the side surface of said tool bit and a large bore in the forward end of said shank

and located in the central portion of said flat surface; (b) a retaining pin rockingly received in one end of said bore with the head of said retaining pin projecting out of said one end of said bore, said retaining pin additionally having a generally spherical large diameter portion continguous to said head portion and a generally cylindrical small diameter stem portion depending from said large diameter portion, said large diameter portion being received in an enlarged portion of said bore, and said small diameter portion being received in a smaller diameter portion of said bore for retaining said large diameter portion of said pin in said large diameter portion of said bore,



said small diameter portion of said pin having an annular groove at the bottom thereof with a retaining ring received therein for holding said pin in said shank and said small diameter portion of said pin additionally controlling the rocking movement of said pin in a rocking direction; (c) a tightening screw in said shank located in a position for urging said small diameter stem portion of said retaining pin in said rocking direction by engaging said small diameter stem portion at substantially its lower end and thereby urging said tool bit against said upstanding sidewall and holding said retaining pin within said shank.

4,220,429

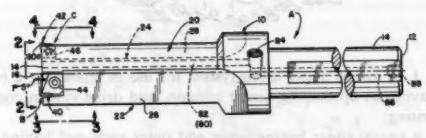
INDEXABLE INSERT DRILL

Thomas R. Powers, and Ricky L. Clark, both of Rogers, Ak., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 16, 1979, Ser. No. 30,095

Int. Cl.[3] B23B *51/00, 31/10;* **B26D** *1/12*

U.S. Cl. 408—224 **16 Claims**



1. An indexable insert drill comprising:

an elongated, generally cylindrical body having a longitudinal axis extending between first and second terminal body ends, a portion of said body adjacent said first end comprising a shank portion and a portion of said body adjacent said second end comprising a drilling portion;

first and second grooves extending axially of said body along at least a section of said drilling portion with each of said grooves extending to said second end and terminating in an insert receiving pocket; and,

a cutting insert disposed in each said pocket, each insert having a cutting edge of a length less than the radius of said second end extending radially of said body at a location axially outward of said second end with a negative lead and substantially neutral radial and axial rake, the cutting edge on one of said inserts extending from the longitudinal axis of said body to an outermost end spaced at least two thirds the distance along the radial dimension of said body second end and the cutting edge of the other of said inserts extending at least from a point radially inward of said one insert cutting edge outermost end to an outermost end at least slightly beyond the radial outermost area of said body second and, at least said one insert cutting edge outermost end being located further axially outward than said other insert cutting edge outermost end.

4,220,430

POSITIONING DEVICE FOR POSITIONING A MOVABLE PART OF A MACHINE TOOL RELATIVE TO A FIXED PART

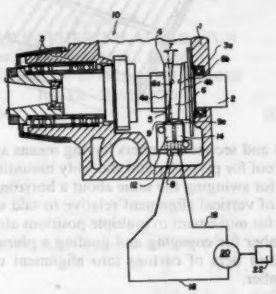
Gerd Meiser, and Heinz Dillhöfer, both of Witten-Annen, Fed. Rep. of Germany, assignors to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,331

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742404

Int. Cl.[2] B23B *47/06;* **B23Q** *3/18*

U.S. Cl. 409—231 **5 Claims**



1. A positioning device for positioning a part, such as a movable part of a machine tool, relative to a fixed part, such as a machine tool housing, comprising, a housing, a spindle rotatably mounted in said housing adapted to move relative to a selected position in respect to said housing, a position transmitter adapted to be secured to one of said housing and said spindle, said position transmitter including a cylindrical member having first and second transmitter surfaces, said first and second transmitter surfaces being axially spaced part, a differential transmitter adapted to be secured to the other of said fixed and movable parts and having first and second heads adapted to be disposed in alignment with respective portions of said first and second transmitter surfaces, said differential transmitter being mounted in said housing alongside said spindle, said heads producing a control signal responsive in accordance with the amount of said heads aligned with said respective portions of said first and second transmitter surfaces, control means connected to said first and second heads for positioning said movable part in respect to said fixed part, and said positioning transmitter including an annular groove separating said surfaces having axially spaced apart boundary walls defining said groove which form an angle perpendicular to the axis of rotation of said spindle.

4,220,431

APPARATUS FOR IN FIELD UNITIZING OF CONTAINERS

Eugene W. Place, and David M. Williams, both of Salinas, Calif., assignors to Eagle Research and Development, Inc., Salinas, Calif.

Filed Sep. 14, 1977, Ser. No. 833,226

Int. Cl.[2] B65G *57/00*

U.S. Cl. 414—35 **14 Claims**

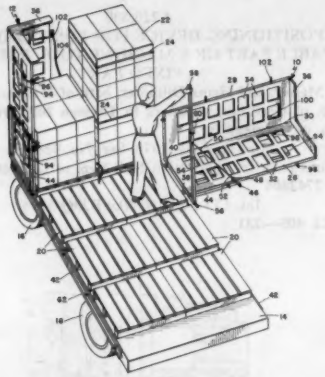
1. A carton stacking guide assembly for guiding the stacking

of cartons in tiers, wherein the improvement in said guide assembly comprises:

a flat planar support member;

an elongated hinge bar mounted on and extending horizontally and parallel to an edge of said support member;

first and second vertically extending guide members connected together at a right angle to one another, one of said



first and second members having means at a bottom edge thereof for pivotally and slideably mounting on said hinge bar for swinging the same about a horizontal axis into and out of vertical alignment relative to said support member and for movement to multiple positions along said support member for engaging and guiding a plurality of adjacent stacked tiers of cartons into alignment on said support member.

4,220,432

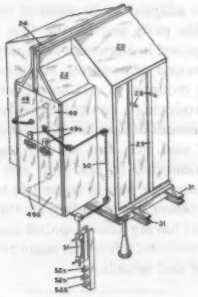
PART GAGING CONTROL FOR LIQUID SEAL SYSTEM

Richard F. Wiggins, Fairfield, Conn., assignor to Gyromat Corp., Bridgeport, Conn.

Division of Ser. No. 672,848, Apr. 2, 1976, Pat. No. 4,108,105. This application Jul. 3, 1978, Ser. No. 921,472

Int. Cl.[2] B65G *49/00*

U.S. Cl. 414—287 **7 Claims**



1. In a paint spray system, comprising a spray housing including an exit door arrangement and means for conveying a workpiece through said housing, and apparatus for automatically opening said exit door, which comprises

(a) detecting means adjacent said housing to detect the presence of said workpiece in response to said conveying means conveying the workpiece to the housing,

(b) first delay timer means operatively connected to said detecting means whereby activation of said detecting means by the presence of the workpiece at said housing activates said first delay timer means,

(c) said first delay timer means being operable to time out at the end of the time period necessary for said conveying means to convey the workpiece to said exit door, and

(d) actuator means mechanically connected to said exit door arrangement and operationally connected to said first delay timer whereby at time-out of said first delay timer means said actuator means will operate to open said exit door arrangement.

3. In a paint spray system comprising a spray housing including an exit door arrangement and means for conveying a workpiece through said housing, an apparatus for automatically opening said exit door arrangement, which comprises

(a) actuator means connected to said exit door arrangement, and

(b) storage means containing part dimension information of said workpiece being conveyed and operationally connected to said actuator means,

(c) said actuator means operable upon said conveying means transporting said workpiece to said exit door arrangement and co-acting with said storage means to open said exit door arrangement in accordance with the part dimension information stored in said storage means whereby said exit door arrangement is opened to a size of opening corresponding to the dimensions of said workpiece.

4,220,433

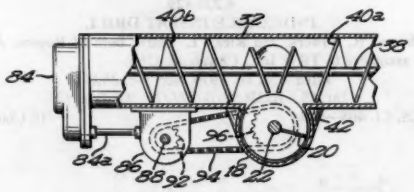
SWEEP AUGER DRIVE SYSTEM

Leon G. Feterl, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.

Filed Jul. 10, 1978, Ser. No. 923,482

Int. Cl.[2] B65G *65/46*

U.S. Cl. 414—298 **4 Claims**



1. A sweep auger drive system for use in unloading a bin having an upstanding center column, said drive system comprising:

a sweep auger having inner and outer ends and having a conveying axis, said sweep auger being mounted radially outwardly from said center column, said inner end being located adjacent said center column, said sweep auger being revolvably mounted about said center column and also rotatably mounted about said conveying axis;

means for transmitting power to said inner end of said auger, the input of said transmitting means being rotatable about an axis parallel to said center column;

means for applying power to said transmitting means, said power applying means comprising sprocket means rotatably mounted about said center column and;

a first flexible connector means encirclingly connecting said sprocket means and said transmitting means input;

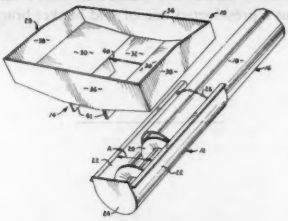
means for rotating said sprocket means, whereby when power is applied, said transmitting means input will rotate and revolve about said center column in a planetary motion causing said auger to rotate about said conveying axis so as to convey grain radially inwardly as well as to sweep around said center column.

4,220,434

HOPPER FOR GRAIN AUGERS

Otto R. Letzig, R.R. 4, Richmond, Mo. 64085

Filed Jun. 21, 1979, Ser. No. 50,663
Int. Cl.³ B65G *3/00, 1/00*
U.S. Cl. 414—326 **4 Claims**



1. A hopper for use with a grain auger comprising:

trough means partially enclosing said auger, said trough means presenting an opening for receiving said auger and having a cross-sectional dimension equal to the diameter of said auger plus sufficient clearance to accomodate turning of the auger therein;

means for defining a holding area for a quantity of grain, said holding area being disposed above said auger;

means for presenting an opening in said holding area of a width corresponding to the width of said trough opening; and

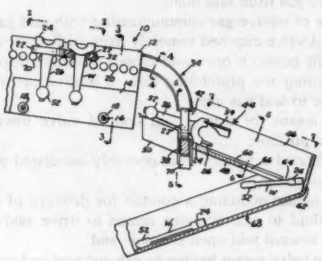
opposed side flaps extending downwardly from said holding area defining means into said trough means and on either side of said auger for coupling said holding area defining means with said trough means.

4,220,435

UNLOADER FOR RING-SHAPED PALLETS

Richard D. Yeakey, Sterling Heights, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Aug. 21, 1978, Ser. No. 935,650
Int. Cl.² B65B *69/00;* **B65G** *11/08*
U.S. Cl. 414—418 **11 Claims**



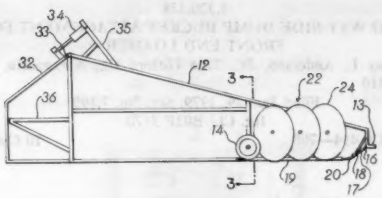
1. A gravity chuting assembly for conveying pallet-supported workpieces and for unloading the workpieces from the pallets, said workpieces being axially elongated and having an enlarged head at one end and an elongated stem projecting axially from said head, said pallet having a transverse dimension larger than the transverse dimension of the head and a central aperture therein having a transverse dimension larger than the transverse dimension of the stem and smaller than the transverse dimension of said head so that the workpiece is adapted to be supported on a horizontally disposed pallet with its axis disposed vertically and with the underside of the head engaging the top face of the pallet and the stem extending vertically downwardly through the central aperture in the pallet, comprising, a gravity chute through which the vertically oriented pallet-supported workpieces are adapted to be conveyed by gravity, a downwardly curved orienting chute extending from the lower end of said gravity chute and through which the pallet-supported workpieces are adapted to gravitate, said orienting chute extending in a generally vertically downward direction at its lower end, said orienting chute having guide means, thereon engageable with the pallets for re-orienting them from a generally horizontally disposed position as they exit from said gravity chute to a generally vertically disposed position, stop means adjacent the lower end of said orienting chute for arresting movement of the pallet in said vertical position, stop means adjacent the lower end of said orienting chute for arresting downward movement of the pallet-supported workpiece in a position inclined downwardly with its head foremost, said workpiece stop means forming a workpiece support surface which is inclined downwardly sufficiently to cause the workpiece to slide forwardly in a downward direction and thus cause the stem to slide out of the central aperture of the vertically disposed pallet.

4,220,436

HAY GATHERING APPARATUS

Douglas D. Gilger, II, Boyes, Mont. 59316

Filed Sep. 23, 1977, Ser. No. 836,029
Int. Cl.² B60P *1/00*
U.S. Cl. 414—434 **10 Claims**



1. Hay gathering apparatus including a supporting framework capable of being attached to a towing vehicle, a plurality of spaced substantially parallel carrier elements disposed longitudinally of said framework in contact with the ground along substantially their entire lengths, each carrier element being flexibly connected only at its forward end to said framework at a point adjacent the attachment of said framework to said towing vehicle, opposing side delivery rakes suspended from said framework adjacent the forward ends of said carrier elements for the transfer of hay from windrows on either side of said framework onto said carrier elements, a moveable end gate suspended from said framework adjacent the rearward ends of said carrier elements, and means for raising the end gate away from said carrier elements, said carrier elements having a center section of elements of a given length and said side sections on each side of said center section having elements which are of a length shorter than those of said center section, and said rakes are mounted on each side of said center section and in front of the respective side sections.

4,220,437

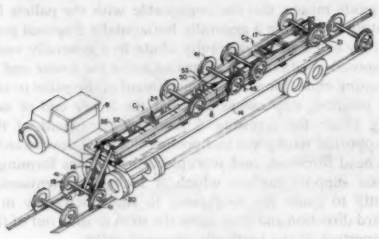
TRAILER MOUNTED APPARATUS FOR HAULING RAILROAD WHEELS

Nick R. DeWitt, Portola Valley, Calif., assignor to Railcar Maintenance Company, San Francisco, Calif.

Filed Jun. 21, 1978, Ser. No. 917,604
Int. Cl.³ B60P *1/00*
U.S. Cl. 414—549 **13 Claims**

1. A transport frame for hauling railroad car wheel sets on a flatbed having a planar surface, said railroad car wheel sets including paired wheels of given diameter interconnected by an axle shaft, said transport frame comprising: at least one axle support surface disposed longitudinally along the length of said transport frame, said axle support surface having a width less

than the inside wheel distance of said wheels of said railroad wheel set; said axle support surface having a vertical heighth sufficient to permit said railroad car wheel set to roll on the interconnecting axle thereof on said support surface while the outer periphery of said wheel set is above the planar surface of



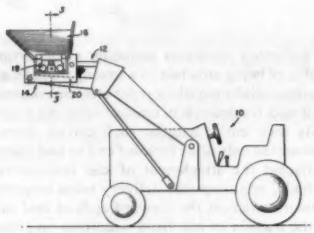
said flatbed upon which said transport frame rests; and guide rail means spaced outwardly of said axle support surface for contacting the interior periphery of said railroad wheels immediately below and forward and behind of the axle of said wheel sets, so that upon rolling movement of said wheel set on said axle, canting movement of said wheel set is resisted.

4,220,438

TWO WAY SIDE DUMP BUCKET ATTACHMENT FOR FRONT END LOADER

Harvey L. Anderson, Jr., 7706 Gifford Ct., Alexandria, Va. 22310

Filed Jan. 29, 1979, Ser. No. 7,199
Int. Cl.³ B02F 3/70
U.S. Cl. 414—705 **10 Claims**



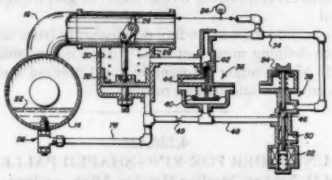
1. For use as an attachment to a front end loader having controlled linkage means for movement of a dump bucket in a plane drawn vertically, longitudinally through the loader, a dump bucket assembly for moving said dump bucket laterally of said vertical, longitudinal plane and to either side thereof comprising: a cradle mounted on the loader linkage means; a dump bucket arranged on said cradle means; and intermediate lateral movement control structure means interconnecting said cradle and dump bucket comprising a horizontally arranged, extended length housing affixed centrally on said cradle, a multi-sectioned, telescoping stabilizing assembly overlying said housing and pivotally interconnected therewith centrally of said housing, bracket means on said bucket for interconnection with the distal ends of said stabilizing assembly, a sliding control member within said housing arranged for fixed limits of travel therewithin, a pair of dual action piston cylinder fluid motors arranged alongside said housing, each said motor having one of its ends pivotally connected through said housing to said control member and its other end pivotally connected to one of said bucket bracket means, a pair of direction control extension means on the ends of said control member, extended through the ends of said housing for selective engagement with one or the other of the bracket means, and a source of fluid under pressure for said motors, said motors being oppositely arranged whereupon selective introduction of fluid under pressure against the piston of one motor and behind the piston of the other motor, said control member is moved within said housing to engage one of said pair of direction control means with a selected bracket means and to disengage the other of said pair of direction control means with the other bracket means to thereby cause said bucket to rotate laterally outwardly about a preselected one of said bucket bracket means.

4,220,439

PNEUMATIC STARTER OVERTEMPERATURE CONTROL

Darrel W. Burch, and James P. Wojciehowski, both of Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 13, 1978, Ser. No. 886,381
Int. Cl.³ F01D 21/12
U.S. Cl. 415—9 **18 Claims**

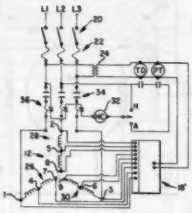


1. A rotary pneumatic motor, comprising:
a casing having a motive gas inlet and a sump for lubricating liquid;
a turbine rotatably mounted in said casing and driven by motive gas from said inlet;
a source of motive gas communicating with said gas inlet;
a control valve disposed remotely from said motor operable to shift between open and closed positions respectively permitting and prohibiting flow of motive gas from said source to said gas inlet;
biasing means for urging said control valve toward said closed position;
fluid operated actuator means operably associated with said control valve;
control means including a conduit for delivery of pressurized fluid to said actuator means to drive said control valve toward said open position; and
fuse plug valve means having an exhaust port and communicating with said conduit and operably associated with said sump to be responsive to temperature of said lubricating fluid therein, said fuse plug valve means operable to automatically interconnect said conduit with said exhaust port to permit said biasing means to overcome said actuator means and shift said control valve to said closed position to prevent rotation of said motor whenever said temperature of the lubricating fluid exceeds a preselected value, said fuse plug valve means including a valve body with an inner end immersed in said lubricating fluid, and an inlet port communicating with said conduit, said valve means further including a movable shut-off valve in said valve body controlling communication between said inlet and exhaust ports.

4,220,440
AUTOMATIC LOAD SEEKING CONTROL FOR A PUMPJACK MOTOR

Noel R. Taylor, and Paul A. Taylor, both of Odessa, Tex., assignors to Superior Electric Supply Co., Odessa, Tex.

Continuation-in-part of Ser. No. 854,389, Nov. 23, 1977, abandoned. This application Apr. 6, 1979, Ser. No. 27,798
Int. Cl.[2] F04B *49/00, 49/06*
U.S. Cl. 417—12 **14 Claims**



1. A well having a downhole pump connected to be stroked by a pumpjack unit; said pumpjack unit having a three phase oilwell pumping motor, the stator of which is connectable in either of Y, ΔY, and Δ configuration, the improvement comprising:

circuit means, including first contact means connecting said stator in Y configuration; said circuit means includes a first sensor means for measuring the current flow through said Y connected stators and for disconnecting said first contact means upon the current flow through said Y connected stators exceeding a first value during a multiplicity of pump strokes;

said circuit means including second contact means for connecting said stator in ΔY configuration upon said first contact means being disconnected by said first sensor means;

said circuit means further including a first timer by which said second contact means is disconnected and said first contact means again connects said stator in Y configuration after a predetermined time interval of a sufficient duration for a multiplicity of pump strokes to occur;

said circuit means further including a third contact means, and a second sensor means, said second sensor means measures the current flow through said ΔY connected stators and causes said second contact means to disconnect said ΔY connection while connecting said stators in Δ configuration upon the current flow through said ΔY stators exceeding a second value during a multiplicity of pump strokes which is greater than said first value;

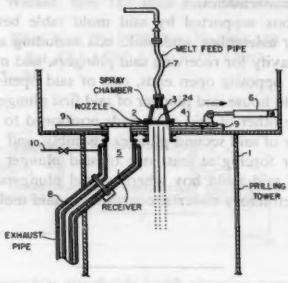
said circuit means further including a second timer by which said Δ connection is disconnected by said third contact means and said second contact means again connects the stator in ΔY configuration after a preselected time interval has expired, the last said time interval being of sufficient duration for a multiplicity of pump strokes to occur.

4,220,441
APPARATUS FOR MAKING PRILLS FROM MELTED SUBSTANCE

Shoji Tomita, and Tetsuya Tokunaga, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Nov. 14, 1978, Ser. No. 960,692
Claims priority, application Japan, Dec. 13, 1977, 52-148843
Int. Cl.[2] B22D *11/01*
U.S. Cl. 425—6 **8 Claims**

1. In an apparatus for prilling a molten substance comprising a prilling tower, at least one nozzle in the upper portion of said tower, each nozzle having one or more orifices to form droplets of a molten substance passing through the orifices of said nozzle, and means for withdrawing prilled product from the lower portion of said tower, the improvement comprising means for moving said nozzle in a horizontal direction from its normal position during the prilling of a molten substance to a

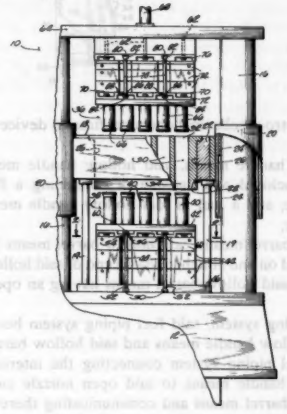


secondary position away from said normal position, and one or more receiving means disposed in said tower beneath the nozzle in the secondary position thereof.

4,220,442
PRESS APPARATUS INCLUDING PLUNGER ADJUSTMENT MEANS

Robert J. Dorsey; Hideo Okunami, both of Chicago, and William T. Savage, Lemont, all of Ill., assignors to Wehr Corporation, Milwaukee, Wis.

Filed Dec. 4, 1978, Ser. No. 965,782
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—344 **12 Claims**



1. Apparatus for use in molding compacted refractory material, the apparatus comprising:

a support structure including a bed,

a first plunger assembly including a plunger supporting member, at least one plunger fixedly secured to said plunger supporting member, means for adjusting the spacing between said plunger supporting member and said bed, said spacing adjusting means including at least one removable shim, said shim being selectively removable whereby the spacing between said plunger and said bed can be varied, and means for releaseably clamping said removable shim between said plunger supporting member and said bed,

a second plunger assembly including at least one plunger,

means for supporting said second plunger assembly in spaced relation from said bed, said supporting means

including at least a pair of spaced parallel columns supported by said support structure,

a mold table supported by said columns between said plunger assemblies,

a mold box supported by said mold table between said plunger assemblies, said mold box including at least one mold cavity for receiving said plungers, said mold cavity having opposite open ends, one of said open ends positioned to house said plunger of said first plunger assembly and the other of said open ends positioned to house said plunger of said second plunger assembly, and

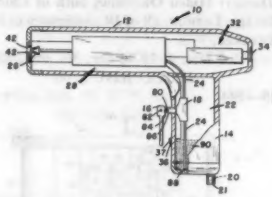
means for forcing at least one of said plunger assemblies toward said mold box whereby said plungers can compress refractory material contained in said mold cavities.

4,220,443

ELECTRO-MECHANICAL CHEMICAL FIREARM DEVICE

Russell M. Bear, 707 Stevenson Rd., Severn, Md. 21144

Filed May 9, 1978, Ser. No. 904,208
Int. Cl.[2] F41H *9/00*; F23Q *7/06*
U.S. Cl. 431—91 **7 Claims**



1. An electro-mechanical chemical firearm device, comprising:

a hollow handle means, said hollow handle means being fully enclosed and capable of containing a fuel under pressure, and a fuel in said hollow handle means under pressure;

a hollow barrel means, said hollow barrel means being surmounted on and attached to one end of said hollow handle means, said hollow barrel means having an open muzzle end;

a fuel piping system, said fuel piping system being within said hollow handle means and said hollow barrel means, said fuel piping system connecting the interior of said hollow handle means to said open muzzle end of said hollow barrel means and communicating therewith, said fuel piping system transporting said fuel from said hollow handle means to said open muzzle end of said hollow barrel means;

an electrical power system within said hollow handle means and said hollow barrel means, said electrical power system being capable of producing a high-voltage spark at said open muzzle end of said hollow barrel means, said high-voltage spark being capable of igniting fuel from said fuel piping system;

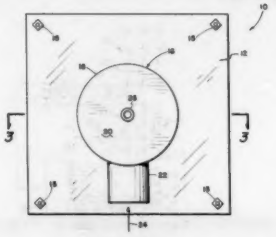
a dual trigger mechanism consisting of a first trigger member to release said fuel under pressure in said hollow handle, and a second trigger member to activate said electrical power system to produce said high-voltage spark, said first and second trigger members being capable of concurrent operation and of independent operation, said first trigger member being capable of lateral movement to clear said second trigger member.

4,220,444

GAS BURNER FOR FLAME ADHERENCE TO TILE SURFACE

Robert D. Reed, and Hershel E. Goodnight, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 27, 1978, Ser. No. 881,772
Int. Cl.[2] F23M *9/00*
U.S. Cl. 431—348 **3 Claims**



1. A gaseous fuel burner for enhanced flame adherence to an outwardly flared tile surface in a furnace, having

a gaseous fuel burner tube having a nozzle at its distal end, and a plurality of radial orfices, circumferentially spaced, in a transverse plane;

a circular flange about the burner tube upstream of the orifice plane, to restrict the annular area for air flow, and to create an eddy zone downstream of the flange;

a cylindrical combustion-air plenum, coaxial with the burner tube;

means to supply combustion air to the plenum at a selected super-atmospheric pressure P1;

a circular concentric air tube opening in the distal wall of the plenum coaxial with the plenum and the burner tube;

vane means in the plenum to provide rapidly spinning air moving helically along the air tube, the improvement characterized by

a circumferential groove cut into the tile of a diameter larger than the air tube and positioned downstream of the circular flange and opposite the radial orifices of the burner tube.

4,220,445

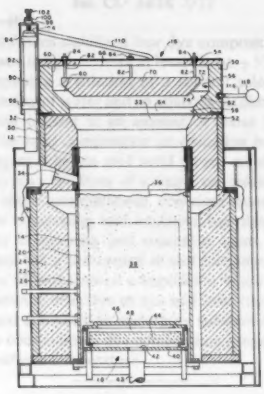
FLUID BED FURNACE AND COVER ASSEMBLY FOR USE THEREON

William L. James, Homewood, and Hans J. Staudenmaier, Glendale, both of Ill., assignors to Fennell Corporation, Harvey, Ill.

Filed Nov. 6, 1978, Ser. No. 958,140
Int. Cl.[2] F27D *1/18*; F27B *15/00*
U.S. Cl. 432—250 **17 Claims**

1. A cover assembly for use in a fluid bed furnace of the type including a fluid bed having a material which fluidizes upon being subjected to a sufficient flow of gas and means for distributing a gas mixture at an elevated temperature through the fluid bed material for fluidizing and agitating the fluid bed material, said cover assembly providing both exhaustion of the heated gas mixture from the furnace and confinement of the agitated fluid bed material within the fluid bed comprising: hollow cap means having a bottom, a top, and an inner wall surface, a first aperture in said bottom communicating with the furnace fluid bed, and a second aperture in said top; and baffle means disposed within said hollow cap means between said first and second apertures and having an outer periphery spaced from said cap means inner wall surface and greater in dimension than said second aperture forming a space between

said baffle means periphery and said cap means inner wall surface through which the heated gas mixture is exhausted



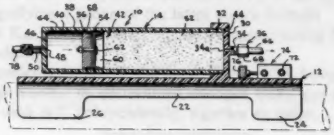
from the fluid bed and forming a barrier for trapping the agitated fluid bed material within the fluid bed.

4,220,446

ATTACHABLE TOOTH CLEANING AGENT DISPENSER FOR DENTAL HANDPIECES

Donald H. Walker, Box 717 Blue Run Dr., Dunnellon, Fla. 32630

Filed Nov. 29, 1978, Ser. No. 966,159
Int. Cl.[3] A61C *1/10, 1/12, 17/02*
U.S. Cl. 433—85 **8 Claims**



1. A removably attachable tooth cleaning agent dispenser for use as a retrofit attachment on a conventional dental handpiece, said dispenser comprising a frame, gripping means for removably attaching said frame to a dental handpiece laterally abutting a handle portion thereof, a reservoir for containing said cleaning agent, means mounting said reservoir on said frame, a dispensing nozzle mountable adjacent a cleaning tool on said dental handpiece, a cleaning agent flow passageway connecting said reservoir and said nozzle, and pneumatic means including a finger operated control valve adjacent said handle portion at a location normally adjacent a finger of the operator when holding the dental handpiece during use and pneumatically movable means responsive to said valve operatively connected with said reservoir for ejecting a cleaning agent from said reservoir into said passageway, and out said nozzle when desired by an operator of said handpiece.

4,220,447

SOLID, FROZEN STABILIZED HAIR DYE

Jean-Francois Grollier, Paris, and Christian Monnais, Neuilly-sur-Seine, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 275,464, Jul. 27, 1972, abandoned. This application Aug. 19, 1975, Ser. No. 605,831

Claims priority, application Luxembourg, Jul. 29, 1971, 63634

Int. Cl.[2] A61K *7/13*

U.S. Cl. 8—406 **1 Claim**

1. A solid frozen stabilized hair dye composition adapted to be thawed at a temperature of at least about +5° C. to a cream or gel comprising a solution of a solvent selected from the group consisting of water and an aqueous alcohol solution, said alcohol being present in an amount of about 20 to 70% by weight of the total composition an oxidation hair dye and an oxidation agent wherein said solid frozen stabilized hair dye composition is in the form of a single use solid portion packaged in a single compartment container comprising a first frozen layer comprising said oxidation hair dye and a second frozen layer comprising said oxidation agent, said first and second layers being juxtaposed in said container, whereby the temperature of said thawed composition when applied to the hair in an amount effective to dye said hair, rises only slightly, whereby said composition undergoes substantially less degradation than conventional dye composition prepared at the time of use at ambient temperature.

4,220,448

PROCESS FOR DRY-CLEANING OR DE-OILING BY MEANS OF A PERCHLOROETHYLENE BASE COMPOSITION

Jean-Claude Cosnard, Saint Germain les Corbeil; Pierre Sarafinof, and Vitat Jean-Claude, both of Antony, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 1, 1978, Ser. No. 956,626

Claims priority, application France, Jun. 30, 1978, 78 19588

Int. Cl.[2] D06L *1/00*

U.S. Cl. 8—142 **6 Claims**

1. A process for anti-redeposition of greying factors on textiles of natural, synthetic or artificial fibers or mixtures thereof, comprising dry cleaning or de-oiling the textile by means of stabilized perchloroethylene, containing 1.25–10% by weight of at least one nitroalkane compound having from 1 to 4 carbon atoms.

4,220,449

QUATERNATED POLYAMINE SALTS

Hans-Peter Baumann, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

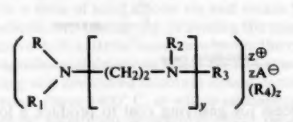
Continuation of Ser. No. 554,481, Mar. 3, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,840

Claims priority, application Switzerland, Mar. 8, 1974, 3285/74

Int. Cl.[2] D06P *5/06*

U.S. Cl. 8—606 **10 Claims**

1. A polyamine salt of formula



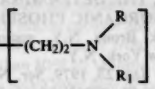
in which

R signifies a C_{10-22} alkyl, C_{10-22} alkenyl, phenyl-(C_{1-3})alkyl or naphthyl-(C_{1-3})alkyl radical,

R_1 signifies a phenyl-(C_{1-3})alkyl or naphthyl-(C_{1-3}) alkyl radical,

y signifies 0 or an integer 1 to 5,

each R_2 and R_3, independently, has one of the significances of R_1 or signifies a group of formula



wherein R and R_1 are as defined above, any repeating R,R_1 and groups of the above formula being independent from each other, and at least one of R_2 or the R_2's and R_3 signifying a group of the latter above formula

each R_4, independently, signifies a quaternating C_{1-6} alkyl radical,

z signifies a number in the range 0.75 to 1.25, being an average number of quaternated nitrogen atoms per molecule, and each $A^{\ominus}$, independently, signifies an anion.

4,220,450

CHEMICALLY INDUCED FLUORESCENCE IMMUNOASSAY

Edward T. Maggio, Redwood City, Calif., assignor to Syva Company, Palo Alto, Calif.

Filed Apr. 5, 1978, Ser. No. 893,910

Int. Cl.[2] G01N *33/16, 31/14;* C09K *11/00*

U.S. Cl. 23—230 B **32 Claims**

1. A method for determining in an assay solution, the presence of an analyte in a sample suspected of containing said analyte, said analyte being a member of an immunological pair consisting of ligand and antiligand, said ligand having at least one epitopic site and said antiligand being capable of specifically binding to said epitopic site of said ligand; wherein a light emitting reciprocal pair are employed as labels, said light emitting reciprocal pair consisting of a chemiluminescence source having at least one component and a quencher capable of quenching the light emitted by said chemiluminescence source without collision, said labels being conjugated to members of said immunological pair to form a chemiluminescence label conjugate and a quencher label conjugate, and wherein in said assay solution the amount of quencher brought within quenching distance of said chemiluminescence source is related to the amount of analyte in said assay medium;

said method comprising:

A. combining in an aqueous medium to form an asssay solution:

1. said sample;

2. said chemiluminescence label conjugate;

3. said quencher label conjugate;

4. any additional components of said chemiluminescence source; with the proviso that:

a. when said analyte is monoepitopic ligand and neither of said labels are conjugated to ligand, poly(ligand analog) is included in said assay solution;

b. when said analyte is polyvalent antiligand for monoepitopic ligand, poly(ligand analog)-label or poly(ligand analog) or the combination of quencher label ligand and chemiluminescer label ligand is included in said assay solution and when said analyte is monovalent antiligand, poly(ligand analog)-label is included in said assay solution;

c. when said analyte is antiligand for polyepitopic ligand and neither label is conjugated to ligand, ligand is included in said assay solution;

d. when said analyte is polyepitopic ligand and both the quencher label and the chemiluminescer label are bonded to ligand, antiligand is included in said assay solution;

wherein said ligand analog has at least one epitopic site common with said ligand and capable of competing with ligand for antiligand; and

B. measuring the amount of light emitted from said assay solution at at least one wavelength as compared to the amount of light emitted from an assay solution having a known amount of analyte.

4,220,451

PROCESS FOR THE DETERMINATION OF SERUM INORGANIC PHOSPHATE

John A. Stefanchik, Bronx, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 23, 1979, Ser. No. 5,875
Int. Cl.[2] G01N *33/16, 21/22*
U.S. Cl. 23—230 B 5 Claims

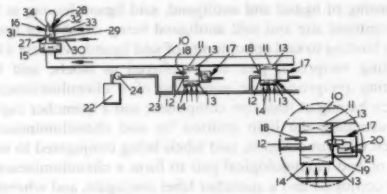
1. In a process for the determination of serum inorganic phosphate in a phosphate-containing body fluid wherein such determination is made utilizing a centrifugal analytical photometer and wherein a mixure is formed of said phosphate-containing body fluid and an ammonium molybdate solution in the presence of a surface active agent, the improvement which comprises utilizing said surfactant as a solution in a lower alkanol wherein the ratio of surfactant to alkanol is within the range of from about 20:80 to about 80:20 by volume.

4,220,452

DETECTION OF GASES

Geddes A. Bray, Moston, Manchester, England, assignor to Mather & Platt Limited, Manchester, England

Filed Jan. 26, 1979, Ser. No. 6,718
Claims priority, application United Kingdom, Feb. 7, 1978, 4772/78
Int. Cl.[2] G01N *31/12, 33/22*
U.S. Cl. 23—232 R 22 Claims



1. A method of detecting the presence of a foreign gas in a gaseous medium of known combustion properties, comprising the steps of:

(a) providing a pipework arrangement defining a plurality of inlet ports;

(b) continuously drawing into the pipework arrangement via the inlet ports a possibly contaminated gaseous medium at a known rate;

(c) providing a fire safe container which forms a port of the pipework arrangement and which defines an inlet and an outlet;

(d) providing flame traps associated with the inlet and outlet of the fire safe container;

(e) passing samples of the possibly contaminated medium through the fire safe container via the inlet and outlet through the flame traps;

(f) supplying a reference gas of known combustion properties to the fire safe container at a known rate;

(g) continuously mixing the sample in the fire safe container with the reference gas;

(h) providing ignition means within the fire safe container;

(i) actuating the ignition means to attempt to ignite the gaseous mixture in the fire safe container;

(j) providing an exhaust system for the pipework arrangement;

(k) ducting the gaseous mixture drawn from the fire safe container to the exhaust system for safe disposal;

(l) providing detection means associated with the fire safe container whereby ignition of the gaseous mixture within the fire safe container can be checked; and

(m) monitoring the detection means whereby the presence of a foreign gas above a predetermined concentration in the gaseous medium can be detected.

4,220,453

PROCESS FOR PRODUCING ARTIFICIAL FIRE LOGS

Morris E. Holder, P.O. Box 9283, Chattanooga, Tenn. 37412

Filed Jun. 11, 1979, Ser. No. 47,093
Int. Cl.[2] C10L *5/00*
U.S. Cl. 44—10 B 11 Claims

1. A process for making artificial fire logs, comprising the steps of:

providing a mixture of wood material and a binder in quantity sufficient to fill a tubular mold open at both ends;

dividing said quantity of mixture into two portions;

introducing said portions of mixture into the mold at each of the open ends thereof;

applying pressure to the mixture in the mold from both of the open ends so as to compress the mixture within the mold;

closing both ends of the mold to maintain the mixture introduced therein at a fixed volume, so that the compressed mixture cannot expand out of the mold due to internally generated pressure;

maintaining the mold ends closed while effecting at least partial curing of the mixture within the mold;

removing the closures from the ends of the molds; and

removing the finished fire log from the mold.

6. In a process for producing artificial fire logs wherein a quantity of intermixed cellulosic combustible material and a binder material are molded into a shape which simulates the size and appearance of a fire log, the improvement comprising the steps of:

providing a tubular hollow mold open at each end;

dividing the quantity of mixture into two portions of approximately equal volume; and

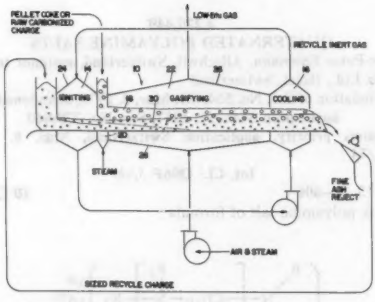
loading the mixture into the mold by introducing each portion into a separate open end of the mold.

4,220,454

PROCESS FOR GASIFYING PELLETIZED CARBONACEOUS FUELS

Thomas E. Ban, South Euclid; John C. Sheppard, Cleveland, and William H. Marlowe, Euclid, all of Ohio, assignors to McDowell-Wellman Company, Cleveland, Ohio

Filed Dec. 29, 1978, Ser. No. 974,611
Int. Cl.[2] C10J *3/00*
U.S. Cl. 48—202 10 Claims



1. A process for gasifying coal to produce a low Btu gas containing large amounts of hydrogen and carbon monoxide, comprising the steps of continuously forming a generally horizontally moving, quiescent gas-permeable bed comprising at least one layer of a sized recycle charge of unreacted coke and at least one layer of fresh coal, moving said bed horizontally, igniting the surface of one of said layers to initiate an oxidizing reaction zone which travels as a wave from said surface downwardly into one of said layers and as a wave upwardly into any superposed layer, moving air and an inert fluid vertically

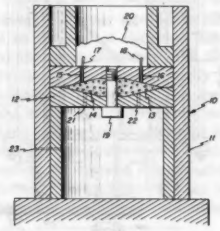
through the bed, reducing said coal and unreacted coke in a zone ahead of each advancing wave, terminating the oxidizing reaction before the reaction reaches at least one outermost surface of the bed to minimize the formation of carbon dioxide, wherein said oxidizing reaction is terminated when carbon dioxide emitted from the bed reaches about 10%, or said bed is about 4 feet deep and said oxidizing reaction is terminated when the reducing zone is about 1½ feet deep, separating unreacted coke of a predetermined size from ash, and returning said unreacted coke to the bed as said recycle charge.

4,220,455

POLYCRYSTALLINE DIAMOND AND/OR CUBIC BORON NITRIDE BODY AND PROCESS FOR MAKING SAID BODY

Philippe D. St. Pierre, Worthington, Ohio; Charles R. Morelock, Ballston Spa, N.Y., and John D. Birle, Galloway, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,289
Int. Cl.² B24D *3/04, 3/10*
U.S. Cl. 51—295 **9 Claims**



1. A process for producing a polycrystalline body of predetermined shape and size which consists essentially of providing at least a substantially uniform mixture of crystals selected from the group consisting of diamond, cubic boron nitride and combinations thereof and a carbonaceous material wherein none of the surfaces of said crystals are exposed significantly and wherein at least a substantial amount of said crystals are enveloped and separated from each other by at least a coherent continuous coating of said carbonaceous material on said crystals, said carbonaceous material being selected from the group consisting of elemental non-diamond carbon, an organic material which completely decomposes at a temperature below 1400° C. to elemental non-diamond carbon and gaseous product of decomposition, and mixtures thereof, said organic material being present in an amount sufficient on decomposition to produce on the crystal surfaces it coats a coherent continuous coating of elemental non-diamond carbon, providing a mold with a cavity of desired size and shape and means for introducing fluid silicon into said cavity and means for maintaining a partial vacuum in said cavity, filling said cavity with said mixture of crystals and carbonaceous material and confining said mixture therein, associating said mixture in said filled cavity with a mass of solid silicon via said means for introducing fluid silicon into said cavity, providing the resulting associated structure with a partial vacuum wherein the residual gases have no significant deleterious effect on said associated structure, heating said associated structure in said partial vacuum to a temperature above 1400° C. at which said silicon is fluid and which has no significant deleterious effect on said crystals, introducing said fluid silicon to said confined mixture via said means for introducing fluid silicon into said cavity and infiltrating said fluid silicon throughout said confined mixture, said partial vacuum being at least sufficient to remove gas from said confined mixture which blocks said infiltrating fluid silicon, said infiltrating silicon reacting with non-diamond elemental carbon forming silicon carbide, cooling the resulting infiltrated mass of crystals in an atmosphere which has no significant deleterious effect on said infiltrated mass, and recovering the resulting polycrystalline body of said predetermined shape and size wherein the crystals are bonded together by a bonding medium comprised of silicon carbide and elemental silicon and wherein the bonded crystals range from about 1% by volume up to about but less than 80% by volume of the total volume of said body, said body being pore free or containing pores up to less than about 5% by volume of said body.

4,220,456

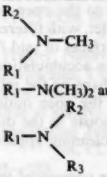
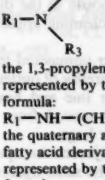
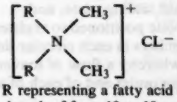
PAINT REMOVAL COMPOSITION SPRAY METHOD FOR PAINT BOOTHS

William V. Block, Apple Valley, Minn., assignor to Fremont Industries, Inc., Shakopee, Minn.

Filed Jun. 21, 1979, Ser. No. 50,669
Int. Cl.² B01D *47/00*
U.S. Cl. 55—85 **3 Claims**

1. The method of separating airborne overspray mists of paint from ambience which includes the steps of:

(a) providing a flow of an aqueous solution of a deactivator formulation comprising:

Component	Percent Range by Weight
(1) A fatty acid nitrogen derivative selected from the group consisting of a primary, tertiary, 1,3-propylene diamine, and quaternary ammonium chlorides; each with a fatty carbon chain length of from 10 to 18 carbon atoms, and wherein: (i) the primary fatty acid nitrogen derivative is represented by the structural formula: $R_1—N—H_2$ (ii) the tertiary fatty acid nitrogen derivatives are represented by the structural formula:  $R_1—N(CH_3)_2$ and  (iii) the 1,3-propylene diamines are represented by the structural formula: $R_1—NH—(CH_3)_2—NH_2$ (iv) the quaternary ammonium chlorides fatty acid derivatives are represented by the structural formula:  with R representing a fatty acid carbon chain length of from 10 to 18 carbon atoms, and wherein R_2 represents an alkyl group of from 1 to 3 carbon atoms;	1 to 10
(2) an alkyline agent selected from the group consisting of calcium hydroxide, sodium metasilicate, and mixtures thereof;	10 to 50
(3) bentonite clay; and	10 to 50
(4) an aliphatic petroleum distillate having a lower boiling point of greater than about 150° C.	1 to 10

(b) permitting the spray to remain in contact with the aque-

ous solution until the paint has become deactivated, and thereafter separating the deactivated paint from the aqueous solution.

4,220,457

CLEANING APPARATUS FOR HOSE FILTERS

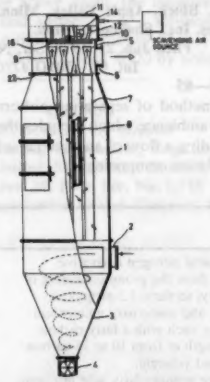
Knud V. Fredriksen, Jerslev Maskinfabrik A/S, Stationsvej 1, 4490 Jerslev Sj., Denmark

Filed Jan. 16, 1979, Ser. No. 3,796

Claims priority, application Denmark, Jan. 16, 1978, 188/78

Int. Cl.[2] B01D *46/04*

U.S. Cl. 55—273 **8 Claims**



1. In a hose filter assembly including a plurality of filter bags having open outlet ends arranged in at least one circular line and in which exterior dust-containing air is directed through the walls of said filter bags to provide a flow of filtered air within the interior of said filter bags to the open outlet ends thereof and thence to a filtered air outlet, with filtered out dust particles clinging to the outer wall surfaces of said filter bags, cleaning apparatus for removing the accumulation of particles from the walls of said filter bags by the introduction of a flow of scavenging air into the open outlet ends of said filter bags in a direction opposite to the direction of flow of filtered air therein, said cleaning apparatus comprising:

an enclosed scavenging air chamber connected to a source of scavenging air and having a plurality of outlet members arranged in at least one circular line and having open outlet ends registering with and spaced from the open outlet ends of the respective filter bags,

a rotatable sealing plate mounted adjacent the open ends of said outlet members and sealing the same against passage of scavenging air therethrough,

drive means for rotating said sealing plate, and

an aperture in said sealing plate positioned to register successively with the outlet members in each circular line as said sealing plate is rotated, whereby a flow of scavenging air is introduced into the open outlet end of each of said filter bags successively.

4,220,458

FILTER APPARATUS

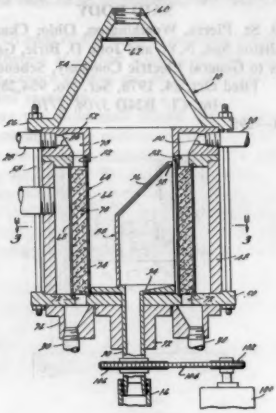
Edward Koppelman, Encino; Robert G. Murray, Palo Alto; Charles E. Lapple, Los Altos Hills, all of Calif., and A. Kishan Rao, St. Louis, Mo., assignors to KGM Associates, Encino, Calif.

Filed Jan. 22, 1979, Ser. No. 5,214

Int. Cl.[2] B01D *41/02*

U.S. Cl. 55—283 **11 Claims**

1. A filter apparatus for extracting particulate matter from a fluid comprising means defining a fluid passageway formed with a fluid inlet and a fluid outlet, a filter element disposed in said passageway between said inlet and said outlet and in intercepting relationship relative to the fluid passing therethrough, said filter element comprising a pair of spaced apart substantially circular cylindrical concentric foraminous walls defining therebetween an annular filter chamber, a particulated granular filter medium in said filter chamber, a supply conduit disposed in communication with said filter chamber for introducing said filter medium thereto and a discharge conduit disposed in communication with said filter chamber at a position remote from said supply conduit for withdrawing said filter medium therefrom, separator means in communication with said discharge conduit for separating said filter medium from any entrained particulate filtered material, conveying means for



recirculating the separated said filter medium to said supply conduit, collector means formed with an inlet port overlying a portion of and disposed contiguous to the upstream face of said filter element and the filtered particulate material formed thereover, said collector means including discharge means for discharging the collected particulate material to a position exteriorly of said passageway, conduit means connected to the interior of said collector means for effecting a reduction in the fluid pressure therein below the fluid pressure in said passageway of a magnitude sufficient to cause the particulate material adjacent to said inlet port to be dislodged from said upstream face, and drive means for effecting relative movement between said collector means and said filter element in a manner to progressively traverse substantially the entire area of said upstream face for collecting the particulate material thereon.

4,220,459

FILTER DEVICE WITH TOP ACCESS TO FILTER BAG

Ronald W. Hammond, and J. Howard Conley, both of Allison Park, Pa., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

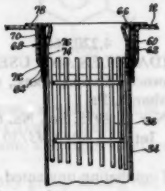
Continuation of Ser. No. 776,665, Mar. 11, 1977, abandoned, which is a continuation of Ser. No. 555,413, Mar. 5, 1975, abandoned. This application Oct. 16, 1978, Ser. No. 951,773

Int. Cl.[2] B01D *46/02*

U.S. Cl. 55—341 R **2 Claims**

1. A multiple bag filter comprising a housing, a horizontally disposed cell plate separating the housing into an upper clean gas plenum chamber and a bag house, said housing having an inlet opening in communication with the bag house and an outlet opening in communication with the clean gas plenum chamber, a plurality of circular openings through the cell plate, a plurality of filter bags open at one end, a resilient ring member fixed in the open end portion of each filter bag, a tubular member extending downwardly from each opening having an inner wall to wall dimension corresponding to the

outer wall to wall dimension of the end portion of a filter bag with the ring member, an annular lip extending inwardly from the lower end portion of each tubular member to define an opening thereby to enable a bag to be raised upwardly through the opening in the cell plate for removal from the top side of the cell plate and to be displaced downwardly through the opening in the cell plate from the top side of the cell plate until the ring member end portion is received in gripping relation within the tubular member and the lowermost portion of the ring member is at rest on the inwardly extending annular lip such that the bag is mounted to the cell plate, a wire cage for



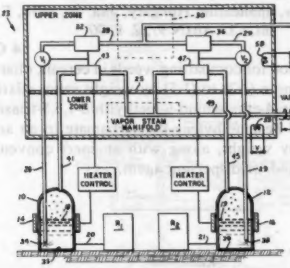
each filter bag having a retainer member in the form of a ring member secured to the top of the cage having a diameter corresponding to the inner diameter of a filter bag and an annular flange portion extending outwardly from the upper end portion for a distance greater than the openings in the cell plate whereby the wire cage and retainer member are each slideable through an opening and through the interior of a filter bag until the flange portion comes to rest on the portion of the cell plate surrounding the opening whereby the end portion of the filter bag becomes confined between the retainer member and the tubular member when in the assembled relation.

4,220,460

VAPOR DELIVERY SYSTEM AND METHOD

Fred P. Partus, Atlanta, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 5, 1979, Ser. No. 9,565
Int. Cl.[2] C03C *25/02*; C03B *37/00*
U.S. Cl. 65—3 A **7 Claims**



1. A system for generating and delivering vapors to a vapor deposition station comprising, in combination, a vaporizer adapted to contain a supply of liquid; a vaporizer heater thermally coupled with said vaporizer and electrically coupled with a heater controller; a temperature controlled chamber located above said vaporizer; means for heating the space within said temperature controlled chamber; a carrier gas intake conduit extending through said temperature controlled chamber and down into said vaporizer through which a carrier gas may be introduced into said vaporizer; a vapor exhaust conduit extending upwardly from said vaporizer and through said temperature controlled chamber through which vapors may be carried from said vaporizer entrained with the carrier gas to the vapor deposition station; and a vapor sensor positioned within that portion of said vapor exhaust conduit located within said temperature controlled chamber and operatively coupled with said vaporizer heater controller.

4,220,461

LOW TEMPERATURE SYNTHESIS OF VITREOUS BODIES AND THEIR INTERMEDIATES

Mrinmay Samanta, P.O. Box 2322, Washington, D.C. 20013

Continuation-in-part of Ser. No. 827,725, Aug. 25, 1977, abandoned. This application Apr. 6, 1978, Ser. No. 894,188
Int. Cl.[2] C03B *19/00*; C03C *11/00*
U.S. Cl. 65—22 **39 Claims**

1. A method for the synthesis of a porous self-supporting body, comprising the steps of:

providing a first solution containing at least one basic glass forming solute wherein said at least one basic glass forming solute is selected from the group consisting of borates, aluminates, silicates, germanates, stannates, plumbates, phosphates, arsenates, antimonates, bismuthates, selenates, tellurates, zirconates, titanates, tungstates, vanadates and molybdates;

providing a second solution containing at least one acidic solute wherein said at least one acidic solute is selected from the group consisting of acids and salts of strong acids and weak bases;

providing in contact with and separating said solutions a permeable barrier substantially impermeable to said at least one basic solute and substantially permeable to said at least one acidic solute; and

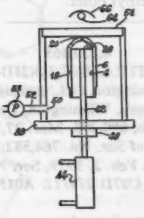
permitting said second solution to pass through said barrier to react with said first solution to deposit on the side of said barrier in contact with said first solution a porous self-supporting body.

4,220,462

APPARATUS FOR MAKING A VACUUM INSULATED CONTAINER

Albert A. Frazier, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.

Division of Ser. No. 522,445, Nov. 11, 1974, abandoned, which is a continuation of Ser. No. 261,424, Jun. 9, 1972, abandoned. This application Jun. 23, 1978, Ser. No. 918,438
Int. Cl.[2] C03B *23/16, 23/20*
U.S. Cl. 65—153 **6 Claims**



1. Apparatus for the manufacture of double walled vacuum bottles, comprising a sealed chamber; means connected to said chamber for evacuating the air therefrom; means movable vertically in said chamber for supporting a double walled bottle to be evacuated having an opening in one wall of the bottle and a sealing element in the opening; means for causing said vertically moving means to move vertically toward a surface of said chamber to cause said sealing element to engage against said surface to deform said sealing element to cause said sealing element to close the opening in the bottle after the bottle has been evacuated.

4,220,463

AMMONIUM NITRATE CONTAINING FERTILIZER BODIES HAVING IMPROVED PROPERTIES DURING STORAGE AND TRANSPORTATION

Willy H. P. Van Hijfte, Trieststraat 24, B-9960 Assenede; Rafaël Goethals, Aardeken 4 a, B-9068 Ertvelde; Anton Niks, de Koor 5, 3600 Sledderlo bij Genk, all of Belgium, and Gerardus F. vander Sijpt, Schoolstraat 12, Koewacht, Netherlands

Continuation-in-part of Ser. No. 898,331, Apr. 20, 1978, Pat. No. 4,150,965. This application Feb. 26, 1979, Ser. No. 15,227

Claims priority, application Netherlands, Apr. 28, 1977, 7704686

Int. Cl.[2] B01J *2/30*; C05C *1/02*

U.S. Cl. 71—27 2 Claims

1. Ammonium nitrate containing fertilizer bodies having improved properties during storage and transportation, characterized in that the individual fertilizer bodies have a uniform and substantially continuous coating of C_{12}–C_{18} alkylamine(s) in the solid state throughout their entire surface, and a thin layer of mineral oil over said coating produced by the process comprising, in succession,

1. a first stage in which ammonium nitrate containing fertilizer bodies having a temperature above the melting point of the amine(s) are coated with a uniform and substantially continuous layer of molten C_{12}–C_{18} alkylamine(s);
2. a second stage in which the bodies are cooled to a temperature sufficiently low to convert the coating entirely into the solid state;
3. and a third stage, in which the bodies are coated with a thin layer of mineral oil.

4,220,464

PHENYLGLYOXYLONITRILE-2-OXIME-CYANOMETHYL ETHER AS PLANT GROWTH REGULATOR

Henry Martin, Allschwil, Switzerland, assignor to CIBA-GEIGY Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 772,700, Feb. 28, 1977, Pat. No. 4,152,137, which is a continuation-in-part of Ser. No. 717,792, Aug. 25, 1976, Pat. No. 4,070,389. This application Aug. 30, 1978, Ser. No. 938,210

Claims priority, application Switzerland, Sep. 4, 1975, 11458/75

Int. Cl.[2] A01N *21/02*

U.S. Cl. 71—77 5 Claims

1. A method for promoting the germination of seed of cultivated plants, wherein the seed is treated, before or during germination, with an effective amount of phenylglyoxylonitrile-2-oxime-cyanomethyl ether.

4,220,465

IMIDAZOTHIAZINE-1,3(2H)-DIONES

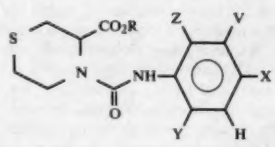
Jiin-Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 890,295, Mar. 27, 1978, which is a continuation-in-part of Ser. No. 764,582, Feb. 1, 1977. This application Feb. 2, 1979, Ser. No. 8,853

Int. Cl.[2] C07D *279/12*; A01N *9/12*

U.S. Cl. 71—90 15 Claims

1. A compound of the formula:



where

X is hydrogen, fluorine, chlorine, bromine, cyano, methyl, methoxy or nitro;

Y is hydrogen, fluorine, chlorine or methyl;

Z is hydrogen, fluorine or methyl;

V is hydrogen, fluorine, chlorine or OR; and

R is propargyl or alkyl of 1 to 4 carbon atoms with the proviso that when V is other than H, at least one X, Y and Z must be other than H.

11. A method for the control of undesirable vegetation comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.

4,220,466

4,5-DICYANOIMIDAZOLES AND USE AS HERBICIDES

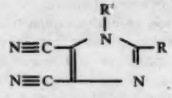
Natu R. Patel, Shawnee Mission, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1975, Ser. No. 628,003

Int. Cl.[3] A01N *43/50*

U.S. Cl. 71—92 70 Claims

1. The method of combating unwanted vegetation comprising applying pre- or post-emergently an effective amount of a compound having the general structural formula:



in which R is H and R' is —CO—S—CH_3.

4,220,467

COMPOSITION AND METHOD FOR COMBATTING WEEDS IN CEREALS

Zsolt Dombay; Erzsébet Grega neé Tóth, both of Miskolc; Ferenc Havelka, Budapest, and Anna Kovásznay, Miskolc, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Jan. 16, 1979, Ser. No. 3,950

Claims priority, application Hungary, Jan. 20, 1978, EA 184

Int. Cl.[2] A01N *9/22, 9/00*

U.S. Cl. 71—93 4 Claims

1. A composition for combatting weeds in cereals, characterized by containing a (1:2) to (1:5) by weight ratio, mixture of 2-tert.-butylamino-4-ethylamino-6-methylthio-1,3,5-triazine and S-ethyl-N,N-hexamethylene-thiocarbamate in an amount of 10 to 80% by weight, along with an inert conventional carrier, diluent and/or dispersing agent.

4,220,468

HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

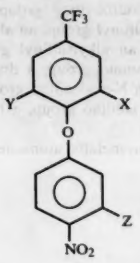
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 719,484, Aug. 31, 1976, Pat. No. 4,093,446, which is a continuation-in-part of Ser. No. 617,560, Sep. 29, 1975, Pat. No. 4,063,929, and Ser. No. 617,562, Sep. 29, 1975, Pat. No. 4,046,798, which is a division of Ser. No. 331,719, Feb. 12, 1973, Pat. No. 3,928,416, said Ser. No. 617,560, is a continuation-in-part of Ser. No. 331,719, , which is a continuation-in-part of Ser. No. 234,651, Mar. 14, 1972, Pat. No. 3,798,276. This application Feb. 27, 1978, Ser. No. 881,227

Int. Cl.[2] C07C *43/22*; A01N *9/24*

U.S. Cl. 71—124 14 Claims

1. A compound of the formula



wherein

X is hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4) alkyl group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a (C_1–C_4)alkoxy group having one or more hydrogen atom replaced by a (C_2–C_4) (alkenyl group, or a (C_2–C_4-)alkynyl group.

9. A herbicidal composition which comprises a compound according to claim **1** and an agronomically-acceptable carrier.

11. A method of controlling weeds which comprises applying to the surface of the growth medium prior to the emergence of the weeds from the growth medium a compound according to claim **1** in an amount sufficient to control the growth of the weeds.

4,220,469

METHOD FOR PRODUCING REDUCTION GASES CONSISTING ESSENTIALLY OF CARBON MONOXIDE AND HYDROGEN

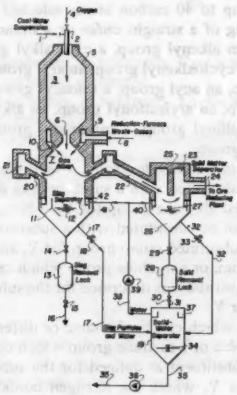
Kurt Tippmer, Recklinghausen, Fed. Rep. of Germany, assignor to Firma Carl Still, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,129

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735565

Int. Cl.[2] **C21B** *13/00*

U.S. Cl. 75—91 **8 Claims**



1. A single heat method of producing reduction gases consisting essentially of carbon monoxide and hydrogen for ore-reducing processes, comprising, burning a coal and water suspension with oxygen in a reactor to generate combustion gases under pressure having a temperature in the range of from 1300° C. to 1500° C., mixing the combustion gases immediately after they are formed with reduction furnace waste gases having a temperature of from 100° C. to 500° C. to form mixed gases having temperatures lower than the combustion gases, and to quench slag particles out of said combustion gases, directing said mixed gases through a solid matter to separate residual solid matter and to form purified mixed gases, scrubbing the purified mixed gases of H_2S, and directing said scrubbed, purified mixed gases to a reduction furnace.

4,220,470

SILVER HALIDE MATERIAL CONTAINING PHOTOGRAPHIC MAGENTA COUPLER

Nobuo Furutachi; Kotaro Nakamura; Atsuaki Arai; Minoru Yamada, and Keisuke Shiba, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

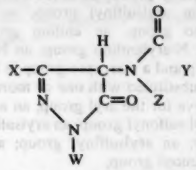
Continuation of Ser. No. 616,480, Sep. 24, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,318

Claims priority, application Japan, Sep. 24, 1974, 49-109822

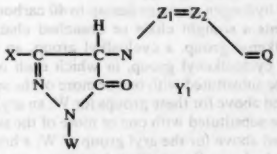
Int. Cl.[2] **G03C** *7/00, 1/40*

U.S. Cl. 430—387 **15 Claims**

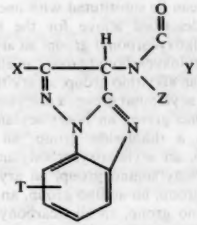
1. A photographic silver halide emulsion containing a photographic magenta coupler represented by the following general formulae (IV), (V), (VI) or (VII)



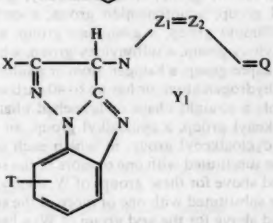
(IV)



(V)



(VI)



(VII)

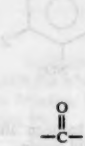
wherein W represents a hydrogen atom, or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group or a cycloalkenyl group, in which each of these groups can be substituted with one or more of a halogen atom, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a

carbamoyl group, an acylamino group, a diacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an arylalkoxycarbonylamino group, an alkoxy(thiocarbonyl)amino group, an arylalkoxy(thiocarbonyl)amino group, a sulfonamido group, a heterocyclic group, an arylsulfonyl group, an alkylsulfonyl group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group or a mercapto group; an aryl group, which can be substituted with one or more of a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an arylalkoxycarbonylamino group, an alkoxy(thiocarbonyl)amino group, an arylalkoxy(thiocarbonyl)amino group, a sulfonamido group, a heterocyclic group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-alkylanilino group, an N-arylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group; a heterocyclic group, which can be substituted with one or more of the substituents described above for the aryl group; an acyl group; a thioacyl group; an alkyl sulfonyl group; an arylsulfonyl group; an alkylsulfinyl group; an arylsulfinyl group; a carbamoyl group; and a thiocarbamoyl group,

X represents a hydrogen atom; or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, or a cycloalkenyl group, in which each of these groups can be substituted with one or more of the substituents described above for these groups for W; an aryl group which can be substituted with one or more of the substituents described above for the aryl group of W; a heterocyclic group which can be substituted with one or more of the substituents described above for the heterocyclic group for W; an alkoxycarbonyl group; an aryloxycarbonyl group, an aralkyloxycarbonyl group, an alkoxy group; an aryloxy group, an alkylthio group, an arylthio group, a carboxy group, an acylamino group, a diacylamino group, an N-alkylacylamino group, an N-arylacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an arylalkoxycarbonylamino group, an alkoxy(thiocarbonyl)amino group, an arylalkoxy(thiocarbonyl)amino group, an anilino group, an alkylamino group, a cycloamino group, an alkylcarbonyl group, an arylcarbonyl group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a guanidino group, a cyano group, an acyloxy group, a sulfonyloxy group, a hydroxy group, a mercapto group, a halogen atom or a sulfo group;

T represents a hydrogen atom; or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, or a cycloalkenyl group, in which each of these groups can be substituted with one or more of the substituents described above for these groups of W; an aryl group which can be substituted with one or more of the substituents described above for the aryl group of W; a heterocyclic group which can be substituted with one or more of the substituents described above for the heterocyclic group for W; a cyano group, an alkoxy group, an aryloxy group, a halogen atom, a carboxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an alkylthiocarbonyl group, an arylthiocarbonyl group, a sulfo group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an arylalkoxycarbonylamino group, an alkoxy(thiocarbonyl)amino group, an arylalkoxy(thiocarbonyl)amino group, a sulfonamido group, an alkylsulfonyloxy group, an arylsulfonyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylsulfinyl group, an arylsulfinyl group; an alkylamino group; a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group;

Y represents the non-metallic atoms necessary to form, with Z and the



moiety, a 5-membered or 6-membered ring and is an alkylene group, an alkenylene group, or a methine group, which can be substituted with a substituent having up to 40 carbon atoms selected from the group consisting of a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an alkoxycarbonyl group, an aryloxycarbonyl group, an aralkyloxycarbonyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a carboxy group, an acylamino group, a diacylamino group, an N-alkylacylamino group, an N-arylacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an arylalkoxycarbonylamino group, an alkoxy(thiocarbonyl)amino group, an arylalkoxy(thiocarbonyl)amino group, an anilino group, an alkylamino group, a cycloamino group, an alkylcarbonyl group, an arylcarbonyl group, a sulfonamido group, a carbamoyl group, a sulfamoyl group, a cyano group, an acyloxy group, a sulfonyloxy group, a hydroxy group, a mercapto group, a halogen atom or a sulfo group, an oxygen atom, a sulfur atom, a sulfonyl group, a sulfoxide group, —N═; an imino group which can be substituted with a substituent having up to 40 carbon atoms selected from the group consisting of a straight chain or a branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an acyl group, a thioacyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamoyl group, or a thiocarbamoyl group;

Z represents a sulfoxide group, a methylene group which can be substituted with a substituent as described for the substituted alkylene group for Y, —N═, an imino group which can be substituted with a substituent as described for the substituted imino group for Y, an oxygen atom, a sulfur atom, or a methine group which can be substituted with a substituent as described for the substituted methine group for Y;

Z_1 and Z_2, which can be the same or different, each represents —N═ or a methine group which can be substituted with a substituent as defined for the substituted methine group for Y, where the nitrogen containing ring composed of Z_1 and Z_2 can be part of a condensed ring;

Q_1 represents an oxygen atom or imino group; and

Y_1 represents an ethylene group, a methylene group, or an alkenylene group, in which these groups can be substituted with a substituent as described for the substituted alkylene group or the substituted alkenylene group for Y; an oxygen atom; a sulfur atom; or an imino group which can be substituted with a substituent as described for the substituted imino group for Y.

4,220,471

PHOTOGRAPHIC POLYPROPYLENE COATED PAPER SUPPORT WITH CORONA DISCHARGE TREATMENT AND POLYMERIC SUBBING LAYER

Sukeaki Date, and Seigo Ebato, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 4, 1978, Ser. No. 948,644
Claims priority, application Japan, Oct. 13, 1977, 52-122730
Int. Cl.[2] G03C *1/87*
U.S. Cl. 430—532 7 Claims

1. A photographic material comprising a support having on the surface a polypropylene resin component treated with corona discharge, a subbing layer which is applied to said polypropylene resin surface and comprises (a) at least one water-dispersed polymer latex selected from butadiene-acrylic ester copolymers, polyvinyl chloride homopolymer and polystyrene homopolymer, (b) a compound having at least two ethyteneimino groups in the molecule and (c) a water-soluble polymer compatible with said water-dispersed polymer latex, and at least one hydrophilic protective colloid layer including a silver halide emulsion layer provided on said subbing layer.

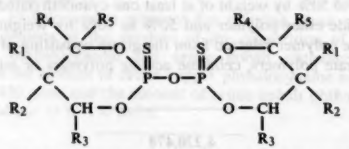
4,220,472

DIOXAPHOSPHORINANE DERIVATIVES AS FLAMEPROOFING AGENTS

Claudine Mauric, Basel, and Rainer Wolf, Allschwil, both of Switzerland, assignors to Sandoz Ltd., Basle, Sweden

Filed Jul. 23, 1975, Ser. No. 598,198
Claims priority, application Switzerland, Jul. 30, 1974, 10463/74; May 26, 1975, 6720/75
Int. Cl.[2] C08K *5/51*
U.S. Cl. 106—18.18 11 Claims

1. A flameproofed polymeric organic material containing, as a flameproofing agent, a flameproofing effective amount of a compound of the formula,



in which

each R_1, independently, is hydrogen, C_1–C_4 alkyl, chloromethyl, bromomethyl or phenyl,

each R_2, independently, is hydrogen, C_1–C_4 alkyl, chloromethyl or bromomethyl,

or R_1 and R_2, together with the carbon atom to which each is attached, on each dioxaphosphorinane ring independently, complete a cyclohexane, cyclohexene or 3,4-dibromocyclohexane ring,

each of R_3 and R_5, independently, is hydrogen or C_1–C_4 alkyl,

and each R_4, independently, is hydrogen or methyl,

with the provisos (i) that at least one of R_1, R_2, R_3, R_4 and R_5 from each dioxaphosphorinane ring is other than hydrogen, and (ii) that when, on a dioxaphosphorinane ring, each of R_1 and R_2, independently, is chloromethyl or bromomethyl, or R_1 and R_2 together with the carbon atom to which each is attached complete a ring, then each of R_3, R_4 and R_5 on that same dioxaphosphorinane ring is hydrogen.

4,220,473

PROCESS FOR TREATING AZO PIGMENTS

George H. Robertson, Cincinnati, Ohio, assignor to Sun Chemical Corporation, New York, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,678
Int. Cl.[2] C09B *67/00*; C09D *11/02*
U.S. Cl. 106—23 10 Claims

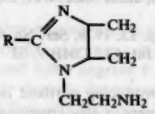
1. A process for modifying an azo arylamide pigment which comprises contacting at a temperature of at least about 50° C. the pigment with an amine of a dimer acid, an amido amine of a dimer acid, or an imidazoline amine of a dimer acid having an amine value of about 100 to 500, said amine of the dimer acid having the structure

$$R(CH_2NHCH_2CH_2CH_2NH_2)_2,$$

said amido amine of the dimer acid having the structure

$$R(CONHCH_2CH_2NHCH_2CH_2NH_2)_2$$

and said imidazoline amine of the dimer acid having the structure



wherein R is a residue of a dimer acid.

10. A printing ink containing a mixture of an azo pigment and a modified azo pigment composition prepared by the process of claim 1.

4,220,474

AMORPHOUS REFRACTORY COMPOSITIONS

Seiichi Uemura; Syunichi Yamamoto, both of Kawasaki; Takao Hirose, Kamakura; Hiroaki Takashima, Kawasaki; Osamu Kato, Yokohama, and Minoru Nagai, Kawasaki, all of Japan, assignors to Nippon Oil Co., Ltd. and Shinagawa Refractories Co., Ltd., both of Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,259
Claims priority, application Japan, Jan. 19, 1978, 53-3726
Int. Cl.[2] C04B *35/52*
U.S. Cl. 106—44 6 Claims

1. An amorphous refractory composition comprising refractory aggregate and a petroleum-derived binder prepared by:

providing as the starting oil a fraction boiling at not lower than 150° C., the fraction being obtained by thermal or steam cracking of petroleum-derived hydrocarbons,

feeding the thus provided fraction continuously into a first-step agitating vessel maintained at a pressure of at least 2 Kg/cm^2 and a temperature of from 300° to 360° C., where the fraction is heat treated for an average residence time of at least 15 minutes,

withdrawing the first-step treated fraction continuously from the first-step agitating vessel,

feeding the thus-withdrawn first-step treated fraction continuously into a second-step agitating vessel maintained at a temperature of from 370° to 450° C., where the first-step treated fraction is heat treated for an average residence time of from 30 minutes to 10 hours,

withdrawing the second-step treated fraction continuously from the second-step agitating vessel and

removing the light fraction from the second-step treated fraction, thereby to obtain the petroleum-derived binder.

4,220,475

RAW MIX FOR PRODUCING PORTLAND CEMENT CLINKER

Vladimir A. Tokar, ulitsa Revoljutsii, 65, kv. 6; Maria I. Zubik, ulitsa Postysheva, 9 kv. 35, both of Krivoi Rog; Anatoly I. Ternovoi, ulitsa Florentsii, 9, kv. 9, Kiev; Vladimir G. Demikhovsky, ulitsa Kosiora, 78, kv. 7, Krivoi Rog; Pavel N. Galkin, ulitsa 40 let Sovetskoi Ukrainy, 78, kv. 32, Zaporozhie; Stanislav I. Gashenko, ulitsa Gorkogo, 159, kv. 76, Zaporozhie; Alexandr A. Rogatkin, ulitsa 40 let Sovetskoi Ukrainy, 76, kv. 3, Zaporozhie; Leonid P. Khlopkov, ulitsa 40 let Sovetskoi Ukrainy, 24, kv. 11, Zaporozhie; Lidia I. Lekalova, ulitsa 40 let Sovetskoi Ukrainy, 58, kv. 39, Zaporzhie; Larisa A. Telina, ulitsa Nemirovicha-Danchenko, 14, Zaporozhie, and Yakov M. Mylenko, ulitsa Stalevarov, 24, kv. 41, Zaporozhie, all of U.S.S.R.

Filed Sep. 13, 1978, Ser. No. 942,098

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—89 **1 Claim**

1. A raw mix for producing portland cement clinker, comprising a lime component, a clay component, an iron-containing component, and a modifying agent which is a cake by-product of the titanium and magnesium production, the percentage by weight composition of the mix being as follows:

lime component,	88.3 to 77.8
clay component,	9.2 to 11.2
iron-containing component	2.0 to 5.0
modifying agent,	0.5 to 6.0

wherein said modifying agent comprises a cake having a dry percentage by weight composition as follows:

C,	2.0 to 6.0
TiO_2,	10.0 to 13.0
FeO,	2.0 to 10.0
Al_2O_3,	7.0 to 10.0
SiO_2,	7.0 to 30.0
CaO,	15.0 to 30.0
$CaCl_2$,	5.0 to 13.0
$CaCO_3$,	20.0 to 50.0
MgO,	5.1 to 9.0
MnO,	0.18 to 30.0
V_2O_5,	0.12 to 0.40
Cr_2O_3	0.30 to 0.80
S,	0.09 to 1.5
Cl,	3.0 to 10.0

4,220,476

CEMENT KILN PLANTS

Jorn Touborg, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Copenhagen, Denmark

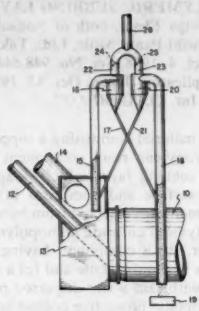
Filed Sep. 14, 1978, Ser. No. 942,454

Claims priority, application United Kingdom, Sep. 14, 1977, 38317/77

Int. Cl.[2] C04B *7/02*

U.S. Cl. 106—100 **17 Claims**

1. A method of operating a cement kiln plant in which alkalis are present in the form of vapours in hot dust-laden kiln gases comprising by-passing at least a portion of the kiln gases upwardly through a first riser pipe communicating with the hot kiln exit gas opening, separating at least a portion of the kiln dust particles from said by-passed kiln gases and directing said kiln dust particles to the lower portion of a second riser pipe, directing relatively cold gases upwardly through said second riser pipe so as to contact said kiln dust particles separated from the gases by-passed through said first riser pipe thereby permitting said kiln dust particles to be cooled, separating at least a portion of the kiln dust particles from the gases of said second riser pipe and directing the kiln dust particles thus separated to the lower portion of said first riser pipe so as to contact the kiln gases by-passed upwardly therethrough, and



permitting at least certain of the alkali-laden dust particles to be removed from said second riser pipe.

4,220,477

FLEXIBLE MICROPOROUS CELLULOSIC MEMBRANES AND METHODS OF FORMATION AND USE THEREOF

Robert E. Kesting, Irvine, Calif., assignor to Nuclepore Corporation, Pleasanton, Calif.

Continuation-in-part of Ser. No. 852,776, Nov. 18, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 953,377

Int. Cl.[2] B29D *27/04;* **C08L** *1/18, 1/26*

U.S. Cl. 106—195 **8 Claims**

1. A membrane for microfiltration which comprises a blend of 10% to 50% by weight of at least one cyanoethylated polysaccharide ether polymer and 50% to 90% by weight of at least one polymer selected from the group consisting of cellulose nitrate polymers, cellulose acetate polymers or mixtures thereof.

4,220,478

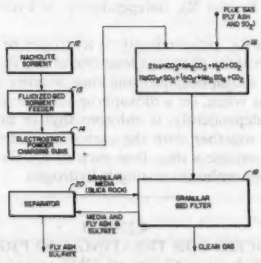
METHOD FOR REMOVING PARTICULATE MATTER FROM A GAS STREAM AND A METHOD FOR PRODUCING A PRODUCT USING THE REMOVED PARTICULATE MATTER

Richard W. Schuff, Phoenix, Ariz., assignor to Newbery Energy Corporation, Los Angeles, Calif.

Filed Dec. 4, 1978, Ser. No. 966,096

Int. Cl.[2] C08L *95/00;* **B03C** *3/14*

U.S. Cl. 106—281 R **10 Claims**



1. A method for removing particulate matter from a gas stream, comprising:

(a) directing fluidized sorbent particles through electrostatic charging guns and injecting the charged sorbent particles

into a mixing chamber to provide a large charged surface area;

(b) electrostatically charging said particulate matter by directing said gas stream through said mixing chamber into contact with said charged sorbent particles;

(c) directing said gas, charged particulate matter, and charged sorbent particles through a granular bed of media; and

(d) filtering said charged particulate matter and charged sorbent particles by electrostatic attraction and inertial impact with said granular bed.

7. In a method for producing a product, said product including a granular media and a powder sorbent additive, and wherein said method generates airborne particulate matter to be removed from a gas stream, the improvement comprising the steps:

(a) injecting electrostatically charged powder sorbent additive particles into said gas stream to induce electrostatic charges on said particulate matter;

(b) passing said gas stream, with said electrostatically charged sorbent particles and said particulate matter therein, through a moving bed of said granular media to remove said sorbent particles and particulate matter; and

(c) continuously removing said media with attached electrostatically charged sorbent additive and particulate matter for incorporation into said product while continuously replacing said granular media.

4,220,479
PHTHALOCYANINE PIGMENTS FOR COLORING PLASTICS

Stanley F. Huffner, and Hugh M. Smith, both of Cincinnati, Ohio, assignors to Sun Chemical Corporation, New York, N.Y.

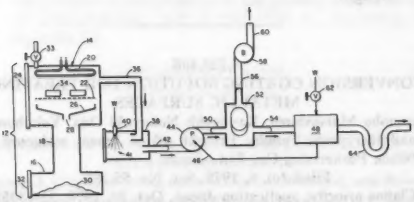
Filed Dec. 7, 1978, Ser. No. 967,127
Int. Cl.[2] C09B 47/04
U.S. Cl. 106—288 Q **4 Claims**

1. A phthalocyanine pigment for coloring clear plastics which consists of the product of the co-attrition of crude copper phthalocyanine and crude cobalt phthalocyanine wherein the amount of crude copper phthalocyanine is about 380 to 450 parts and the amount of crude cobalt phthalocyanine is about 15 to 150 parts.

4,220,480
PROCESS FOR VACUUM PYROLYSIS REMOVAL OF POLYMERS FROM VARIOUS OBJECTS

Thomas S. Dwan, Wakefield, Mass., assignor to Beringer Co., Inc., Marblehead, Mass.

Continuation of Ser. No. 803,425, Jun. 6, 1977, abandoned. This application Sep. 18, 1978, Ser. No. 942,954
Int. Cl.[2] B08B 7/04
U.S. Cl. 134—5 **2 Claims**



1. The process of removal of organic material coating an object, comprising the steps of

evacuating air from a first space immediately surrounding the object,

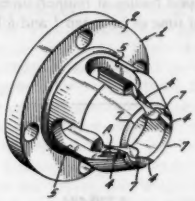
heating said space to cause the temperature thereof to rise into a first range sufficient to fuse said material but insufficient for substantial degradation thereof, said heating causing heat to penetrate said coating in a direction toward said object, whereby a portion of said material is non-degraded form falls from the object, while collecting said falling portion and concentrating and directing its flow by gravity to a drain located within said first space, said portion being permitted to fall from said drain through a conduit connecting said first space to a second space, said conduit being of sufficient orientation and dimensions to substantially thermally isolate said second space from said first space, said second space being maintained at a temperature permitting said portion to resolidify therein, said collected portion being directed to fall from the first space into the second space through the connecting conduit without contacting any intervening structure,

and thereafter further heating said first space to cause the temperature thereof to rise into a second range between 800 degrees F. and 1,000 degrees F., said second range being sufficient to degrade the material remaining on the object including first withdrawing volatile products produced by said degradation from the first space to leave a resulting ash and thereafter introducing air into the first space while maintaining the temperature thereof within said second range, whereby carbon in said ash is combined with oxygen to produce gaseous oxides, including withdrawing said gaseous oxides from the first step to leave a substantially inorganic residue.

4,220,481
LABEL STRIPPING APPARATUS AND METHOD

Arnold M. Bleiman, Yeadon, and Gordon A. Russell, Strafford, both of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Nov. 25, 1977, Ser. No. 854,924
Int. Cl.[2] B08B 7/04
U.S. Cl. 134—6 **6 Claims**



1. A label removing collet cutter having at least two cutting edges, separated by slots of which at least one has at least one of its lengthwise edges outwardly sharpened, which cutting edges are at an angle to an incoming vial and which cutting edges have an internal diameter whereby the label is removed completely and cleanly from the vial when vial is forced through the cutter.

2. Method of removing a label from a vial comprising:

(a) aligning a labeled vial with a collet cutter having at least two cutting edges, separated by slots of which at least one has at least one of its lengthwise edges outwardly sharpened, which cutting edges are at an angle to an incoming vial and which cutting edges have an internal diameter whereby the label is removed completely and cleanly from the vial when the vial is forced through the cutter; and

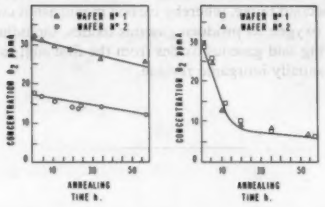
(b) forcing the vial through the cutter whereby the label is removed from the vial.

4,220,482
Patent Not Issued For This Number

4,220,483
METHOD OF INCREASING THE GETTERING EFFECT IN THE BULK OF SEMICONDUCTOR BODIES UTILIZING A PRELIMINARY THERMAL ANNEALING STEP

Victor G. Cazcarra, Mennecy, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 14, 1979, Ser. No. 66,593
Claims priority, application France, Sep. 8, 1978, 78 26223
Int. Cl.[2] H01L *21/324, 29/04*
U.S. Cl. 148—1.5 6 Claims



1. A method of increasing the internal gettering effect in the bulk of silicon semiconductor bodies by generating small clusters which operate as nucleation centers, or precipitation centers, of the oxygen atoms present in the bulk of said bodies, comprising, prior to high temperature thermal cycling, thermally annealing said bodies at temperatures within 750°–900° C. for a length of time of between 1 and 8 hours.

4,220,484
PROCESS FOR THE PREPARATION OF AN ALUMINUM BASE FOR OFFSET PRINTING PLATES AND PRODUCT

Helmut Prohaska, St. Poelten; Franz Reiterer, Vienna; Klaus Bretthauer, Ober-Grafendorf, and Helmut Kloss, St. Georgener, all of Austria, assignors to Folienwalzwerk Brueder Teich Aktiengesellschaft, Muehlhofen, Austria

Continuation-in-part of Ser. No. 926,967, Jul. 24, 1978, abandoned. This application Oct. 23, 1978, Ser. No. 953,423
Claims priority, application Austria, Jul. 25, 1977, 5380/77
Int. Cl.[2] C23F *7/06*
U.S. Cl. 148—6.3 8 Claims

1. A process for the preparation of an aluminum base for offset printing plates comprising superimposing together two prerolled aluminum ribbons with an individual thickness of 0.12 to 0.5 mm, rolling the said superimposed ribbons to an individual ribbon thickness of 0.08 to 0.22 mm whereby the mutual contact surfaces have an uniform surface roughness, separating the two ribbons and forming a stable aluminum oxide layer on the uniformly roughened surfaces.

4,220,485
PROCESS FOR SEALING PHOSPHATIZED METAL COMPONENTS

George D. Howell, Alton, and Donald A. Lange, Edwardsville, both of Ill., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 14, 1978, Ser. No. 969,530
Int. Cl.[2] C23F *7/10*
U.S. Cl. 148—6.15 Z 1 Claim

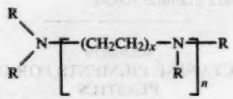
1. A process for sealing phosphatized metal components which comprises coating said components with a composition which consists essentially of:

(a) from 5 to 80 weight percent phosphoric acid;

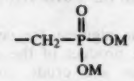
(b) from 1 to 16 weight percent of an acid-soluble zinc compound selected from the group consisting of zinc oxide, zinc nitrite and zinc chloride;

(c) from 0.1 to 10 weight percent of a heavy metal accelerator selected from the group consisting of vanadium, titanium, zirconium, tungsten and molybdenum compounds and/or crystal refiner selected from the group consisting of an acid-soluble salt of nickel, cobalt, magnesium and calcium;

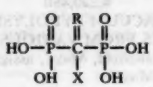
(d) from 1 to 80 weight percent of a phosphonate corrosion inhibitor selected from the group of compounds having the formula:



wherein
R is



M is H, NH_4, alkali metal or combinations thereof;
n is 0 to 6; and
is 1 to 6; and those of the general formula:



wherein X is —OH or $—NH_2$ and
R is an alkyl group of from 1 to 5 carbon atoms; and

(e) sufficient water to dilute the composition to its desired strength.

4,220,486
CONVERSION COATING SOLUTION FOR TREATING METALLIC SURFACES

Yasunobu Matsushima, Kawasaki; Nobuyuki Oda, Yokohama, and Haruyoshi Terada, Tanashi, all of Japan, assignors to Nihon Parkerizing Co., Ltd., Japan

Filed Jul. 6, 1979, Ser. No. 55,286
Claims priority, application Japan, Oct. 30, 1978, 53-133556
Int. Cl.[2] C23F *7/08*
U.S. Cl. 148—6.15 R 6 Claims

1. A conversion coating solution for treating metallic surfaces which has a pH value in the range of 5.5 to 6.5 and contains therein 0.1 g/liter to 50 g/liter as phosphate ion of acid salts of alkali phosphates, 0.01 g/liter to 0.5 g/liter of stannous ion and 2 to 12-fold by weight as much fluorine ion as said stannous ion.

4,220,487

GELATINOUS COATING FOR ARC WELDING AND METHOD FOR UNDERWATER WELDING

Leonard M. Andersen, 46 Alexander Ave., Yonkers, N.Y. 10704

Filed Oct. 25, 1978, Ser. No. 954,433
Int. Cl.[2] B23K *35/34*
U.S. Cl. 148—24 10 Claims

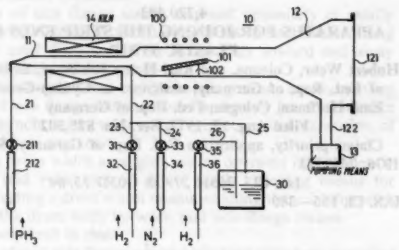
1. A gelatinous coating for use as an insulating coating and fluxing agent in its gelatinous state during underwater arc welding which comprises a gel and particles of electrode coating suspended in said gel, the distribution and quantity of said particles being sufficient to both retain fluidity of the gelatinous coating and to cause said gelatinous coating to be sufficiently electrically conductive to initiate and sustain electrical arcing.

4,220,488

GAS-PHASE PROCESS FOR THE PRODUCTION OF AN EPITAXIAL LAYER OF INDUM PHOSPHIDE

Jean-Pascal Duchemin; Daniel Leguen; Michel Bonnet; Francois Koelsch, and Gerard Beuchet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 6, 1979, Ser. No. 17,969
Claims priority, application France, Mar. 7, 1978, 78 06432
Int. Cl.[2] H01L *21/205, 21/365*
U.S. Cl. 148—175 6 Claims



1. A process for the gas-phase production of an epitaxial layer of indium phosphide which comprises:

preforming a gas containing phosphorous vapor by pyrolyzing phosphine in the gas phase at 700° C.–1000° C. according to equation (1):

$$4\ PH_3 \rightarrow P_4 + 6\ H_2 \qquad (1)$$

introducing said preformed gas stream containing phosphorous vapor into a mixing chamber;

separately introducing into said chamber a mixture comprising nitrogen, hydrogen, and triethyl indium; thereby

reacting said phosphorous in said gas stream with said triethyl indium in said chamber in the presence of a substrate of monocrystalline InP at 350°–700° C., according to equation (2):

$$3/2\ H_2 + \tfrac{1}{4}\ P_4 + In(C_2H_5)_3 \rightarrow InP + 3\ C_2H_6 \qquad (2).$$

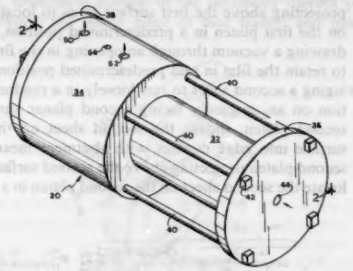
4,220,489

METHOD OF FABRICATING A HOLLOW FILAMENT SEPARATOR MODULE

Myron J. Coplan, Natick; John H. Beale, Medfield, and Robert B. Davis, Framingham, all of Mass., assignors to Albany International Corporation, Menands, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,032
Int. Cl.[2] B65H *81/00*; B32B *1/08*
U.S. Cl. 156—73.6 2 Claims

1. In a process for the preparation of a hollow filament separatory module comprising a bundle of filaments at one end of which is an encapsulating polymeric mass, the steps of slicing through the polymeric mass to a depth sufficient to intersect fiber loops lying therein at a time in the cure cycle of the polymer before final cure and after sufficient gelation has occurred to permit clean slicing, and thereafter completing the cure of the polymeric mass by the passage of time and the application of heat.

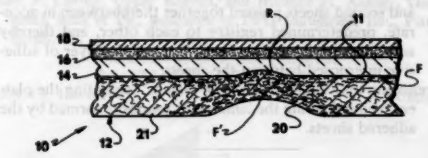


4,220,490

METHOD OF MAKING A LAMINATE WITH REMOVABLE SCORED PAPER BACKING

Russell L. Carlson, Tallmadge, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Mar. 5, 1979, Ser. No. 17,500
Int. Cl.[2] B32B *31/00*; B65C *9/25*
U.S. Cl. 156—257 6 Claims



1. A method of making laminate for use in making a label or the like from a fibrous paper backing layer having one porous surface, which layer is laminated to a face sheet and comprising forming scored linear areas in the said surface of said paper backing layer by appreciable compaction of the paper to provide embrittlement in said scored linear areas while supporting the layer from its other surface, thereafter applying a liquid release layer to said other surface of said backing paper and drying such layer, applying a pressure sensitive adhesive layer to said release layer and drying, providing a moisture content in said backing layer of between 3.5 to 7.0% by weight, and laminating a face sheet to said adhesive layer.

4,220,491

METHOD FOR FORMING AN ACCURATELY ASSEMBLED LAMINATE UTILIZING A VACUUM HOLDING PRESS

Gerald S. Metcalf, Lower Burrell, and Paul J. Kovacik, Ford City, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

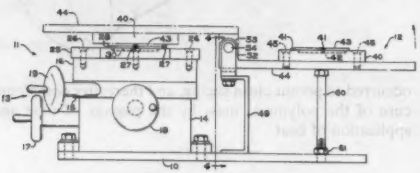
Continuation of Ser. No. 822,185, Aug. 5, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,912
Int. Cl.[2] B29C *17/00*
U.S. Cl. 156—285 3 Claims

1. A method of laminating a pair of sheets having substantially equal areas and at least one of which is a thin plastic film, comprising the steps of:

bringing a first sheet of thin plastic film to rest loosely in a random orientation on an upwardly facing first planar

surface of a first platen with substantially the entire area of the film in contact with and supported by the first planar surface, sliding the film on the first planar surface into edge contact with abutment means on the first platen projecting above the first surface so as to locate the film on the first platen in a predetermined position, and then drawing a vacuum through an opening in the first surface to retain the film in said predetermined position;

bringing a second sheet to rest loosely in a random orientation on an upwardly facing second planar surface of a second platen, sliding the second sheet on the second surface into edge contact with abutment means on the second platen projecting above the second surface so as to locate the second sheet on the second platen in a predetermined position, and then drawing a vacuum through an opening in the second surface to retain the second sheet in said predetermined position;



retaining the first and second platens in mechanically fixed relationship to each other as at least one of the platens is pivoted and said first and second planar surfaces are brought from an upwardly facing orientation to a parallel, face-to-face close adjacency to one another, with the first and second sheets pressed together therebetween in accurate, predetermined registry to each other, and thereby adhering the sheets together by means of a layer of adhesive interposed between the sheets;

releasing the vacuum from both platens, separating the platens, and unloading the laminated composite formed by the adhered sheets.

4,220,492

CONTINUOUS PRESS WITH AT LEAST TWO ADJUSTABLE PAIRS OF COMPRESSION MEMBERS FOR COMPRESSING MULTIPLE PANELS OF INSULATING GLASS

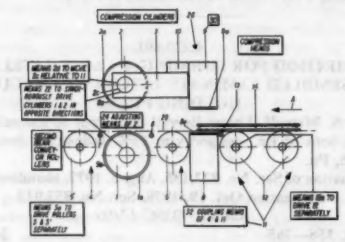
Karl Lenhardt, Neuhausen-Hamberg, Fed. Rep. of Germany, assignor to Firma Karl Lenhardt

Filed Sep. 2, 1977, Ser. No. 830,150

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640153

Int. Cl.[2] B32B *31/00*; B30B *15/14, 7/00*

U.S. Cl. 156—358 **11 Claims**



1. A continuous press for compression of assemblies of multiple flat panels such as of insulating glass with interposed shaped frames provided on both sides with sealing material comprising:

a pair of compression cylinders spaced from each other in parallel alignment;

a beam press having a pair of compression heads spaced from each other in parallel alignment;

a conveyor means for conveying said assemblies in a path of travel in the direction from said beam press toward said cylinders;

said cylinders and said compression heads extending transversely to the direction of said path;

means to reciprocate at least one of said cylinders toward said other cylinder, leaving a spacing between them equal to the thickness of said panel assembly when compressed;

means to reciprocate at least one of said compression heads toward said other compression head, leaving a spacing between them equal to the thickness of said panel assembly when compressed;

sensing means to sense assemblies conveyed over said path through the spacing between said compression heads and operative to actuate the reciprocation of the compression heads into a compression sealing engagement of a portion of said assemblies; and

means to cause the reciprocation of at least one of said cylinders in response to the reciprocation of at least one of said compression heads to actuate the sealing compression of said cylinders against a portion of said assemblies.

4,220,493

APPARATUS FOR JOINING THE STRIP ENDS OF A PLASTIC STRIP

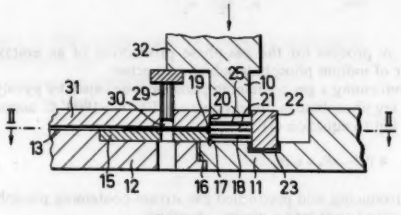
Hubert Wehr, Cologne, and Karl-Heinz Schlösser, Brühl, both of Fed. Rep. of Germany, assignors to Cyklop-Gesellschaft Emil Hoffman, Cologne, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,302

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641373

Int. Cl.[2] B65H *21/00*; G03D *15/04*

U.S. Cl. 156—380 **4 Claims**



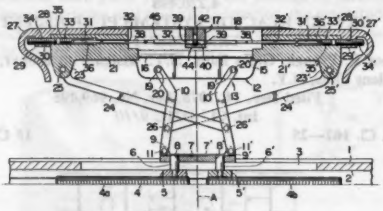
1. An apparatus for joining superposed strip ends of a plastic strip comprising: pressing means for pressing the strip ends together, said pressing means having a sealing ram and a back pressure plate, a first electrode located at one side edge of said pressing means, a second electrode located at an opposite side edge of said pressing means, a channel extending outwardly relative to said pressing means from said one side edge, said channel having a length of wire cloth therein for insertion between said superposed strip ends, said wire cloth having a predetermined width when moved between said pressing means and against said second electrode, said first and second electrodes having a width smaller than the predetermined width of said wire cloth, and a cutting punch having a cutting edge located immediately adjacent said first electrode, said cutting punch providing a cut edge in said wire cloth generally transverse to said width of said wire cloth, piercing tools located at opposite edges of said channel along a line generally transverse to said width of said wire cloth, said piercing tools being disposed a distance from said cutting punch equal to the distance between said first and second electrodes, said piercing tools providing open-edge recesses in said wire cloth at opposed corners thereof.

4,220,494

TIRE BUILDING DRUM

Sinji Kawaida, Higashimurayama, and Yoshihumi Kitayama, Kodaira, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 20, 1978, Ser. No. 952,956
Claims priority, application Japan, Oct. 28, 1977, 52-129955
Int. Cl.[2] B29H *17/16*
U.S. Cl. 156—415 5 Claims



1. A tire building drum, comprising in combination:
a plurality of base segments circumferentially arranged to define as a whole a cylindrical drum body and adapted to be radially expansible;
a pair of side flange means disposed oppositely at axially outer positions of said base segments to be movable along the axial direction of the drum body toward and away from said base segments;
a synchronized drum width changing means axially moving said side flange means toward and away from each other in synchronism with radial retraction and expansion of said base segments;
and a drum width arranging means operated independently of said synchronized drum width changing means for adjusting a drum width measured along the axial direction of the drum body between said side flange means:
characterized in that
each of said side flange means includes a slide base provided axially movably toward and away from each of said base segments and a side flange axially movably toward and away from said slide base; and that
said drum width arranging means includes:
a pair of screw shafts having oppositely threaded portions which are in threaded engagement with said slide base and said side flange, respectively, for connecting said slide base and side flange,
a rotary shaft having axially outer end portions axially slidably received in said screw shafts and rotatable in unison with said screw shafts, and
a rotary shaft rotating mechanism provided at the central portion of said rotary shaft to transform a radial rotational force into an axial rotational force for transmitting the same to said rotary shaft,
whereby said rotary shaft is rotated by said rotary shaft rotating mechanism to cause said side flange to be axially moved toward and away from said slide bases.

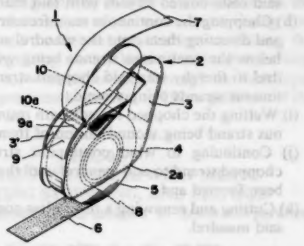
4,220,495

DEVICE FOR TRANSFERRING AN ADHESIVE FILM FROM A TRANSFERRING ADHESIVE TAPE ROLL TO AN ARTICLE

Hiromichi Uchida, Tokyo, Japan

Filed Aug. 29, 1978, Ser. No. 938,305
Claims priority, application Japan, Mar. 6, 1978, 53/28187[U]
Int. Cl.[2] B44C *7/00*
U.S. Cl. 156—577 4 Claims

1. A tape dispenser and tape package for transferring an adhesive film from a roll of adhesive tape to an article, consisting of a frame having a roll support shaft; a roll of adhesive tape rotatably mounted on said roll support shaft and having a rolled adhesive film having pressure-sensitive adhesive on both faces thereof and a rolled removable spacer tape disposed between the adjacent turns of said adhesive film, said transferring adhesive tape roll when mounted on said roll support shaft having the lowermost portion of the periphery thereof protruding beyond the lower edge of said frame; and means



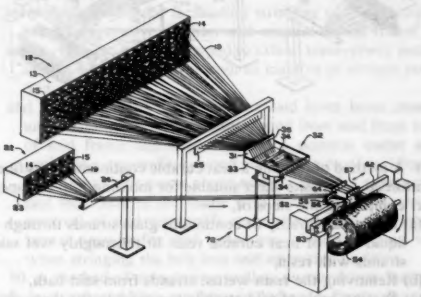
spaced around said frame from said lowermost portion for engaging only the spacer tape and separating it from the next inward turn of adhesive tape and feeding said removable spacer tape out of said frame after it is separated from said adhesive film which has stuck to an article and from the next underlying turn of adhesive tape.

4,220,496

HIGH STRENGTH COMPOSITE OF RESIN, HELICALLY WOUND FIBERS AND CHOPPED FIBERS AND METHOD OF ITS FORMATION

Earl P. Carley, Upper Burrell, and Richard H. Ackley, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1979, Ser. No. 8,365
Int. Cl.[3] B32B *5/02;* B65H *81/00*
U.S. Cl. 156—174 13 Claims



1. A method of forming a heat curable glass fiber reinforced composite sheet containing continuous glass strands and chopped glass strands suitable for molding into a shaped part comprising
(a) Passing a plurality of glass strands through a liquid resin bath to thoroughly wet said strand with resin;
(b) Removing the resin wet strands from said bath;
(c) Passing each of said resin wet strands through a close tolerance orifice to remove excess resin and provide on each strand a desired weight quantity of resin basis the weight of the strand;
(d) Removing the strands from said orifices,
(e) Passing each of the strands through an eyelet in a spacer bar to align the strands in a side by side relationship at precise spaced distances from each other;
(f) Winding the strands onto a rotating mandrel at a helix angle of between 45 to 89.9 degrees while traversing the

spacer bar across the long axis of said mandrel to thereby provide on the surface of said mandrel as it rotates a series of bands of resin coated strands until a layer of strands has been deposited;

(g) Feeding a plurality of continuous resin-free strands to a chopping device positioned below the point of contact of said resin coated strands with said mandrel surface;

(h) Chopping the continuous resin-free strands fed in step (g) and directing them onto the mandrel surface immediately below the continuous strands being wound on said mandrel to thereby trap said chopped strands under the continuous strands being wound;

(i) Wetting the chopped strands with resin from the continuous strand being wound on top of them;

(j) Continuing to wind continuous strands and to feed chopped strand to said mandrel until the desired plies have been formed and

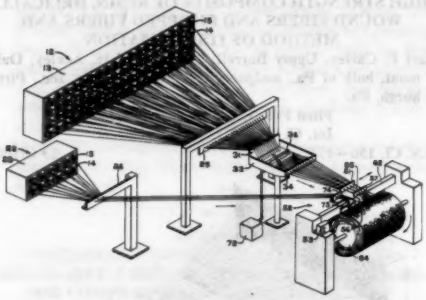
(k) Cutting and removing a resin-glass composite sheet from said mandrel.

4,220,497

HIGH STRENGTH COMPOSITE OF RESIN, HELICALLY WOUND FIBERS AND SWIRLED CONTINUOUS FIBERS AND METHOD OF ITS FORMATION

Earl P. Carley, Upper Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1979, Ser. No. 8,367
Int. Cl.[3] B32B *5/02*; B65H *81/00*
U.S. Cl. 156—174 **7 Claims**



1. A method of forming a heat curable continuous glass fiber reinforced composite sheet suitable for molding into a shaped part comprising the steps of,

(a) Passing a plurality of continuous glass strands through a liquid bath of heat curable resin to thoroughly wet said strands with resin,

(b) Removing the resin wetted strands from said bath,

(c) Passing each of said strands removed in (b) through a close tolerance orifice to remove excess resin and to provide on each strand a desired weight quantity of resin basis the weight of the strand,

(d) Removing the strands from said orifices,

(e) Passing each of the strands through an eyelet in a spacer bar to align the strands in a side by side relationship at precisely spaced distances from each other.

(f) Winding the strands on a rotating mandrel at a helix angle of between 45 to 89.9 degrees while traversing the spacer bar across the long axis of said mandrel to thereby provide on the surface of said mandrel as it rotates a series of bands of resin coated continuous strands,

(g) Continuing to wind strand in (f) until a layer of strand has been deposited on said mandrel,

(h) When the layer of step (g) is provided introducing onto the surface of said mandrel a second group of continuous strands at a rate of speed higher than the peripheral speed of said rotating mandrel to thereby deposit said strands in a swirl pattern and at a point close to but below the point of contact of said helically wound strand to thereby trap said swirled strand under said resin coated strand and to wet said swirl strands with resin,

(i) Continuing to wind said resin-coated strand and said swirled strands until the desired plies have been applied,

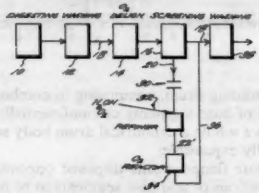
(j) Discontinuing winding when step (i) has been completed and cutting and removing from the mandrel the resulting composite sheet.

4,220,498

OXYGEN REACTOR SYSTEMS PULP REJECT TREATMENT

James R. Prough, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,495
Int. Cl.[2] D21C *9/10*
U.S. Cl. 162—25 **15 Claims**



1. A method of delignification of cellulosic fiber material to minimize the amount of reject material in the final pulp produced, comprising the steps of:

(a) digesting cellulosic fiber material, to produce pulp;

(b) washing the digested pulp;

(c) effecting oxygen delignification of the washed pulp; and

(d) separating at a separation stage reject material from the pulp, and passing the pulp in a main pulp stream, from which the reject material is separated, to a further treatment stage; wherein the improvement comprises:

(e) determining the flow and consistency of the separated reject material and refining the separated reject material; and

(f) adding sufficient chemical to the separated reject material, based upon the flow and consistency thereof, so that subsequent delignification thereof may be effected.

10. Apparatus for delignifying cellulosic fiber material to produce pulp substantially free of reject material, comprising a digestor; means for washing the digested pulp; means for effecting oxygen delignification of the washed pulp; means for separating reject material from the pulp; and a main line pulp conduit interconnecting said digestor washing means, oxygen delignification means, and separating means; wherein the improvement comprises means for determining the flow and consistency of the separated reject material; means for refining the separated reject material; and means for adding sufficient chemical to the separated reject material, based upon the flow and consistency thereof, so that subsequent delignification thereof may be effected.

4,220,499

METHOD FOR DETERMINING THE RELATIVE QUANTITY OF SHIVES IN A STREAM OF FIBROUS PARTICLES

Horatio Hughes, Jr., Charleston, and Robert A. Schilling, Charleston Heights, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 812,056, Jul. 1, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,590
Int. Cl.[2] G01N *1/10, 15/02*
U.S. Cl. 162—49 **4 Claims**

1. A method of determining the relative quantity of shives in

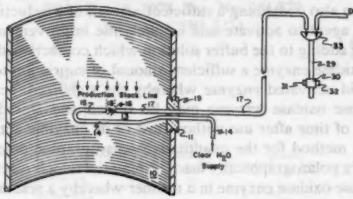
a flowing primary stream of fibrous particles comprising the steps of:

continuously extracting a representative sample flow stream of fibrous particles within said flow stream;

adjusting the consistency of said sample flow stream during said extraction to 0.1% or less;

conducting said consistency adjusted sample stream past a photodetector;

obtaining a composite first signal flow from said photodetector comprising a variable amplitude pulse continuum wherein each pulse represents the passage of individual fibrous particles past said photodetector, the magnitude of such amplitude variations being directly proportional to the size of said fibrous particles;



obtaining a second signal flow of pulses from said first signal flow wherein each pulse in said second signal flow represents a pulse in said first signal flow having an amplitude greater than a reference amplitude;

setting said reference amplitude to a value representing the minimum size of a shive particle;

generating first and second time rate analog signals from each of said first and second signals by counting the number of pulses respectively therein within a common time interval; and,

combining said first and second time rate analog signals to obtain a ratio therebetween and emitting a signal proportional to the ratio.

4,220,500

GLASS-CONTAINING SHEET SUBSTRATE

Toshiyuki Baba; Isao Ebihara, and Masatoshi Minegishi, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,206

Claims priority, application Japan, Jan. 13, 1978, 53-2424

Int. Cl.[2] D21H *1/40;* B05D *3/02;* D04H *1/16*

U.S. Cl. 162—127 **6 Claims**

1. A two-layer water-laid glass fiber-containing non-woven sheet substrate comprising a top layer of a mixture of glass fibers with at least one other fiber selected from the group consisting of pulp, cotton, wool, rock wool, asbestos, rayon, polyvinyl alcohol synthetic fibers, polyamide fibers and polyester fibers which is capable of being intertwined with glass fibers and a back layer of a mixture of the said other fiber with at least one member, in an amount of 5 to 40% by weight based on the said back layer, selected from the group consisting of polyvinyl chloride fibers and polyvinyl chloride latex flocculate, the top and back layers containing a polyvinyl alcohol fiber binder in an amount of at least 5% by weight based upon the total weight of the fibers in the substrate, and the amount of the said glass fibers being 35% by weight or more based on the said substrate, the top layer of the substrate being impregnated with polyvinyl chloride sol without striking through the back layer.

3. A process for producing a two-layer glass fiber-containing non-woven sheet substrate, which comprises water-laying onto a water-laid glass fiber containing top layer sheet formed from a slurry mixture of glass fibers with at least one other fiber selected from the group consisting of pulp, cotton, wool, rock wool, asbestos, rayon, polyvinyl alcohol synthetic fibers, polyamide fibers, and polyester fibers, which is capable of being intertwined with glass fibers, and a polyvinyl alcohol fiber binder; a slurry mixture of at least one member selected from the group consisting of polyvinyl chloride fibers and polyvinyl chloride latex flocculate with the said other fiber and a polyvinyl alcohol fiber binder; the total amount of said polyvinylalcohol fiber binder being at least 5% by weight based upon the total weight of the fibers in the substrate the amount of said glass fibers being 35% by weight or more based on the said substrate, and the amount of the said member being 5 to 40% by weight based on the water-laid sheet containing the said member, impregnating the top layer of said substrate with polyvinyl chloride sol without striking through the back layer and heating the impregnated substrate to effect gellation of the polyvinyl chloride sol.

4,220,501

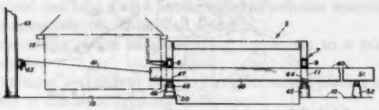
PAPERMAKING MACHINE WITH MEANS FACILITATING STRINGING, AND METHOD

Borgeir Skaugen, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jun. 19, 1979, Ser. No. 49,900

Int. Cl.[2] D21F *1/26*

U.S. Cl. 162—200 **18 Claims**



1. In a papermaking machine including a frame elevated above a floor and having a front side and a rear side and carrying forming means for supporting a facing forming run of an endless porous fabric belt which has a return run about said frame, and substantially fixed supporting means between said floor and said rear side of said frame:

removable means supporting said front said of said frame on said floor;

lever beam means for facilitating stringing of said forming belt into operative position with respect to said frame;

said lever beam means arranged to extend transversely under said frame after removal from an inactive or storage position;

and fulcrum means for supporting said lever beam means under said frame substantially spaced from said front side of said frame and extended into a position under and projecting outwardly beyond said front side of said frame for upward movement about said fulcrum for supporting said front side of the frame with sufficient lift to permit removal of said removable supporting means to clear a lateral passage for said lower run of said forming belt when stringing the belt into said operative position.

10. A method of stringing an endless porous fabric forming belt in a papermaking machine including a frame elevated above a floor and having a front side and a rear side and carrying forming means for supporting an upwardly facing forming run of said belt and providing for a return run about said frame, said frame being substantially fixedly supported over said floor along said rear side and having removable supporting means between said floor and said front side:

moving lever beam means from an inactive or storage position into position under said frame in a transverse orientation wherein said lever beam means extends from a fulcrum rearwardly spaced from said front side and projects outwardly substantially beyond said front side;

operating said lever beam means upwardly about said fulcrum into supporting engagement with the front side of said frame with sufficient lift to relieve frame load from said removable supporting means;

removing said removable supporting means while said front side is supported by said lever beam means, whereby to clear a lateral passage;

stringing said forming belt into operative position relative to

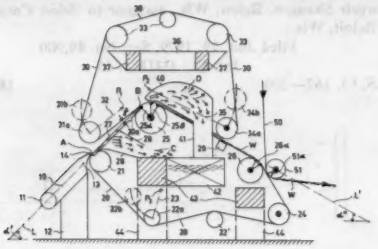
said frame and table means and including moving said return run through said lateral passage;
replacing said removable supporting means;
releasing said lever beam means from supporting relation to said front side of said frame;
and returning said lever beam means to said inactive or storage position.

4,220,502

TWIN-WIRE WEB FORMING SECTION IN A PAPER MACHINE

Kyösti Levänen, Jyväskylä, Finland, assignor to Valmeta Oy, Finland

Filed Feb. 1, 1979, Ser. No. 8,381
Claims priority, application Finland, Feb. 7, 1978, 780380
Int. Cl.[2] D21F *1/24, 1/40*
U.S. Cl. 162—273 **8 Claims**



1. In a paper making machine, a twin wire forming section comprising:
a lower endless carrying wire;
a former roll disposed within the loop defined by said lower endless carrying wire, means defining at least one suction zone on said former roll, the carrying wire having a portion which laps a first sector of the former roll so as to define first and second substantially straight runs of the carrying wire prior and subsequent to said first sector of said former roll, respectively, in the direction of travel of said lower endless carrying wire, said first substantially straight run comprising an initial single-wire portion of a web-forming zone and said second substantially straight run adapted to cooperate with pick-up means at the end thereof;
an upper endless covering wire having a portion directed by breast and traction rolls to lap at least part of that portion of the lower carrying wire which laps said former roll and so that the upper wire is spaced from said first substantially straight run, said lapping upper and lower wire portions defining a twin wire run intermediate of said first and second substantially straight runs, said twin wire run lapping a second sector of said former roll;
means for adjusting the position of said breast and traction rolls in a substantially vertical direction so that the length of said second sector of the former roll lapped by said twin-wire run is adjustable but smaller than said first sector lapped by said carrying wire;
a headbox having a lip slice disposed at the forward end of said initial single-wire portion;
an open-surfaced forming board operatively associated with said initial single wire portion;
and wherein the longitudinal axis of said headbox and the direction of travel of said initial single-wire portion are substantially longitudinally aligned and directed upwardly in the direction of travel of said carrying wire to define a first substantial acute angle with the horizontal and wherein said second substantially straight run is directed downwardly in the direction of travel of said carrying wire to define a second substantial acute angle with the horizontal and wherein the length and position of the twin-wire run is selectively adjustable by suitable adjustment of said breast and traction rolls.

4,220,503

STABILIZATION OF ACTIVATED GALACTOSE OXIDASE ENZYME

Jay M. Johnson, Dayton, Ohio, assignor to The Yellow Springs Instrument Co., Inc., Yellow Springs, Ohio

Filed Apr. 28, 1978, Ser. No. 901,144
Int. Cl.[3] C12Q *1/54, 1/26*
U.S. Cl. 204—1 T **13 Claims**

1. In a method for the quantitative determination of a substance which reacts with a galactose oxidase enzyme in a manner whereby a reactant or a product of said reaction may be analytically measured and wherein said substance is introduced for determination by being included in a buffer solution which is brought into contact with said enzyme, said buffer solution also containing a sufficient amount of a reduction-oxidation agent to activate said enzyme, the improvement comprising adding to the buffer solution which contacts said galactose oxidase enzyme a sufficient amount of cupric ion to stabilize said activated enzyme whereby the stabilized, activated galactose oxidase enzyme may be reused and stored for a period of time after use without loss of its enzymic activity.

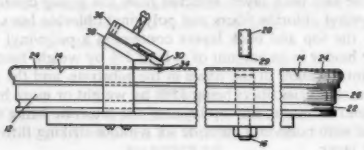
6. A method for the quantitative polarographic determination of a polarographically inactive material which reacts with galactose oxidase enzyme in a manner whereby a reactant or a product of said reaction may be polarographically measured, comprising:
(a) providing a polarographic cell including at least one electrode positioned behind a membrane permeable to the material being measured and in contact with an electrolyte,
(b) establishing a potential across said cell such that a current is produced which is proportional to the amount of hydrogen peroxide or oxygen present on the electrode side of said membrane,
(c) bringing said cell into contact with a quantity of material containing said polarographically inactive material in the presence of galactose oxidase enzyme and a buffer containing a reduction-oxidation agent
said reduction-oxidation agent being present in said buffer in a sufficient amount to activate the galactose-oxidase enzyme,
(d) adding to said buffer a sufficient amount of cupric ion to stabilize the activated enzyme, and
(e) determining the current flowing across said cell as an indication of the amount of said substance present in said quantity of material.

4,220,504

SELECTIVE ELECTROPLATING

William H. Hanley, Los Angeles, and Clarence O. Schrader, Santa Ana, both of Calif., assignors to Burton Silverplating Company, Los Angeles, Calif.

Filed Apr. 16, 1979, Ser. No. 31,909
Int. Cl.[2] C25D *5/06, 17/14, 17/28*
U.S. Cl. 204—15 **22 Claims**



1. A method of electroplating a selective area of a part comprising the steps of:
rotating a disc, said disc having an absorbent upper surface,
continuously maintaining electrolytic solution on the absorbent upper surface of the disc,
maintaining an anodic charge on the disc and the electrolytic solution thereon,

maintaining a cathodic charge on the part to be electroplated, and

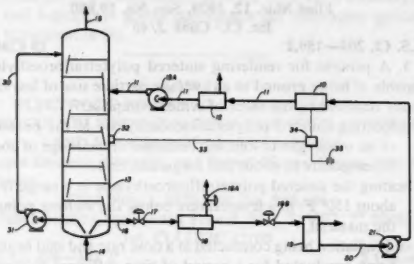
passing the part to be electroplated across at least a portion of a chord of the circle within which the disc rotates, with the selective area of the part in contact with the electrolytic solution on the disc continuously brushing the selective area in a variety of directions and at a variety of speeds as the part passes across the disc.

4,220,505

SEPARATION OF HYDROGEN SULFIDE FROM FLUID STREAMS

Calvin K. Deem, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 6, 1978, Ser. No. 966,829
Int. Cl.[2] C25B *1/24*
U.S. Cl. 204—94 **5 Claims**



1. The process for the removal of sulfur compounds which include hydrogen sulfide from fluid to be treated, comprising,

selecting a halide from a group consisting of potassium iodide and potassium bromide and sodium iodide and sodium bromide,

forming an aqueous solution of the selected halide,

subjecting the aqueous solution to an electrolyzing current to form a tri-halide,

contacting a fluid containing sulfur compounds which include hydrogen sulfide with the solution containing the tri-halide to convert the sulfur compounds to elemental sulfur and to return the tri-halide to the original monohalide state,

and passing solution containing the halide in the original state to that point in the process which follows the contact of the fluid containing the sulfur compounds and the tri-halide solution to absorb the volatile diatomic halogen which vaporizes from the reversible reaction of tri-halide decomposition and passing the absorbing solution of halide and recombined diatomic halogen into the halide solution prior to its subjection to the electrolyzing current.

4,220,506

PROCESS FOR PLATING SOLDER

Peter K. Skurkiss, Short Hills, and Dennis R. Turner, Chatham Township, Morris County, both of N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 11, 1978, Ser. No. 968,619
Int. Cl.[2] C25D *7/06, 17/12, 17/28*
U.S. Cl. 204—28 **17 Claims**

1. An apparatus for electrodeposition of nominally 60/40 tin-lead solder onto a metallic strip comprising

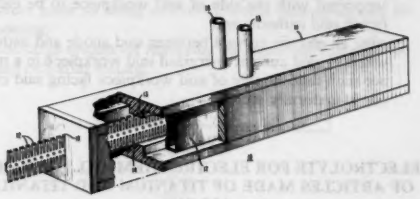
(a) an electroplating container;

(b) a first slotted section for admitting metal strip into the electroplating container, said slotted section being high enough and wide enough to provide clearance for the metallic strip;

(c) means for electrical contact to said metal strip;

(d) a channel for the metallic strip located inside the electroplating container and running from the first slotted section to a second slotted section comprising a groove on top and a groove on the bottom of said container in which the metallic strip is guided through the container;

(e) an anode on at least one side of the channel for the metal strip and parallel to said channel for the metal strip comprising a basket to hold active anode material, said basket at least partially open to permit circulation of plating



solution inside the basket and in which the basket comprises a conducting material inert to said plating solution, where said conducting material consists essentially of monel and said active anode material consists essentially of nominally 60/40 tin-lead solder;

(f) electrical means of connecting the anode to a power supply;

(g) an input and output tube to circulate solder plating solution in the electroplating container;

(h) a second slotted section to permit said metal strip to exit the electroplating cell, said slotted section being high enough and wide enough to provide clearance for the metallic strip.

4,220,507

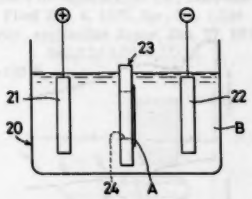
Patent Not Issued For This Number

4,220,508

PROCESS FOR ELECTROLYTIC ETCHING

Yasutoyo Kotani; Kazuo Sawada; Shuzo Nagai; Takao Ogino, and Seiji Watabe, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 27, 1978, Ser. No. 955,168
Claims priority, application Japan, Oct. 28, 1977, 52-130036
Int. Cl.[2] C25F *3/04, 3/14, 7/00*
U.S. Cl. 204—129.65 **10 Claims**



1. A process for uniform electrolytic etching of aluminum or an aluminum alloy, which comprises:

submersing a workpiece made of aluminum or aluminum alloy in an electrolyte which is contained in a tank, said workpiece being located between an anode and a spaced opposed cathode;

supporting said workpiece on an insulating frame so that said workpiece is parallel to said anode and cathode, said insulating frame having at least one opening therein and said insulating frame being larger than said workpiece,

said opening in said insulating frame being smaller than said workpiece so that said workpiece is supported on one side by said insulating frame, around the peripheral regions of said workpiece so that the peripheral regions of said workpiece are covered by said insulating frame, the other side of said workpiece being urged towards said insulating frame and supported by holders and projections mounted on said insulating frame, said workpiece being supported with the side of said workpiece to be etched facing said cathode; and

passing an electric current between said anode and cathode whereby said current energized said workpiece in a manner such that the side of said workpiece facing said cathode is uniformly etched.

4,220,509

ELECTROLYTE FOR ELECTROCHEMICAL POLISHING OF ARTICLES MADE OF TITANIUM AND TITANIUM ALLOYS

Vladlen M. Shtanko, ulitsa Vorovskogo, 17v, kv. 31; Pavel P. Karyazin, ulitsa Vorovskogo, 17v, kv. 34; Sergei N. Sirotkin, ulitsa Gagarina, 62a, kv. 26, all of Chelyabinsk; Jury A. Perimov, prospekt Mira, 21a, kv. 39, Kirovo-Chepetsk Kirovskoi oblasti; Vladimir F. Udaltsov, ulitsa Pervomaiskaya, 7, kv. 31, Kirovo-Chepetsk Kirovskoi oblasti; Nina A. Shut, prospekt Dzerzhinskogo, 7, kv. 14, Kirovo-Chepetsk Kirovskoi oblasti, and Natalya N. Khukhareva, ulitsa Gagarina, 52, kv. 26, Chelyabinsk, all of U.S.S.R.

Filed Jul. 30, 1979, Ser. No. 62,130
Int. Cl.[2] C25F *3/16, 3/18*
U.S. Cl. 204—129.95 **4 Claims**

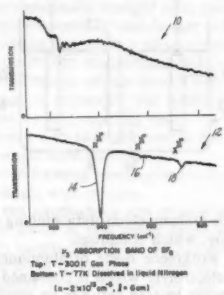
1. Electrolyte for electrochemical polishing of articles made of titanium and titanium alloys, containing:
45–70 percent by weight of sulphuric acid,
4–20 percent by weight of nitric acid,
20–35 percent by weight of hydrofluoric acid,
1–3.5 percent by weight of surface-active agent based on L-sulphocarboxylic acid,
4–20 percent by weight of water.

4,220,510

METHOD FOR SEPARATING ISOTOPES IN THE LIQUID PHASE AT CRYOGENIC TEMPERATURE

Steven R. J. Brueck, Acton, and Richard M. Osgood, Jr., Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 711,714, Feb. 24, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,345
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 R **6 Claims**



1. A process for separating isotopes from an isotopic mixture of a compound dissolved in a cryogenic liquid at a temperature less than about 100° K., which comprises exposing the solution to infrared laser radiation having a radiation frequency that causes excitation of the vibrational energy of a first isotopic molecule of said mixture without exciting the vibrational energy of molecules containing other isotopic forms in said mixture, reacting the compounds containing said vibrationally excited isotopic molecules with a second compound in said liquid or dissociating the compounds containing said vibrationally excited isotopic molecules and separating the products of said reaction or dissociation containing said first isotopic molecules.

4,220,511

TREATMENT OF SINTERED POLY-TETRAFLUOROETHYLENE WITH IRRADIATION AND HEAT TO PRODUCE A GRINDABLE MATERIAL

Rodney L. Derbyshire, Northport, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,890
Int. Cl.[3] C08F *2/46*
U.S. Cl. 204—159.2 **19 Claims**

1. A process for rendering sintered polytetrafloroethylene capable of being ground to an average particle size of less than about 10 microns; the steps of which comprise:
subjecting sintered polytetrafluoroethylene in the presence of air or oxygen to ionizing radiation in the range of about 50 megarads to about 200 megarads, and
heating the sintered polytetrafluoroethylene in a range from about 150° F. to a temperature below the melting point of the material,
said radiation being conducted at a dose rate and said heating being conducted for a period of time sufficient to render said sintered polytetrafluoroethylene capable of being ground to an average particle size of less than about 10 microns.

4,220,512

MORPHOLOGY STABILIZATION OF HETEROGENEOUS POLYMER BLENDS

Georg G. A. Bohm, Akron, and Charles J. Nelson, Munroe Falls, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jan. 24, 1977, Ser. No. 761,560
Int. Cl.[3] C08H *3/28, 3/24;* C08L *7/00, 9/00*
U.S. Cl. 204—159.12 **14 Claims**

1. A process for making a heterogeneous elastomer blend having a stabilized morphology, comprising the steps of:
blending elastomer components to form the heterogeneous blend,
said elastomer components made from conjugated dienes having from 4 to 12 carbon atoms and an ethylene-propylenediene terpolymer elastomer,
the number average molecular weight of said elastomer component made from conjugated dienes and said ethylene-propylene-diene terpolymer elastomer ranging from about 50,000 to about 1,000,000,
said heterogeneous elastomer blend containing from about 10 percent to about 90 percent by weight of said elastomer made from said conjugated dienes and from about 10 percent to about 90 percent by weight of said ethylene-propylene-diene terpolymer,
said heterogeneous elastomer blend having an initial morphology,
crosslinking said heterogeneous elastomer by irradiating said elastomer blend,
irradiating said elastomer blend to an extent such that said elastomer blend contains from about 0.1 to 15 percent gel, and
processing said irradiated heterogeneous elastomer blend,
said processed irradiated heterogeneous elastomer blend having essentially the same morphology as said initial morphology so that a stabilized morphology is formed.

4,220,513
EPOXIDE-CONTAINING COMPOSITIONS AND THEIR POLYMERIZATION

George E. Green, Stapleford, England, and Sheik Abdul-Cader Zahir, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

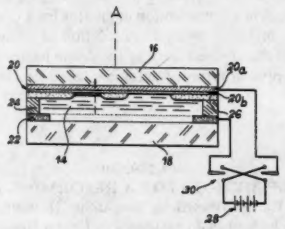
Filed Jan. 19, 1979, Ser. No. 4,959
Claims priority, application United Kingdom, Jan. 20, 1978, 2598/78
Int. Cl.[2] C08G *59/66*
U.S. Cl. 204—159.23 10 Claims

1. Polymerisable compositions comprising
(a) a compound containing in the same molecule both at least one 1,2-epoxide group and at least two groups chosen from allyl, methallyl, and 1-propenyl groups and
(b) a compound containing at least two mercaptan groups per molecule in an amount such that (a) provides a total of from 0.4 to 2.4 equivalents selected from allyl, methallyl, and 1-propenyl group equivalents per mercaptan group equivalent in (b).

4,220,514
ELECTRODE FOR AN ELECTROLYTIC CELL PARTICULARLY FOR ELECTROLYTIC DISPLAY CELLS AND PROCESS OF MANUFACTURE

Jacques Duchene, Grenoble, and Robert Meyer, Gieres, both of France

Filed Nov. 1, 1978, Ser. No. 956,646
Claims priority, application France, Nov. 7, 1977, 77 33383
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 P 5 Claims



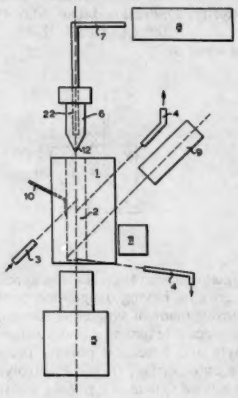
1. A process for the formation of an electricity-conducting coating with a given configuration on an electrically insulating support, wherein on said electrically insulating support are successively deposited a first layer of an electricity-conducting material consisting of indium oxide doped with tin and a second layer of another electricity-conducting material consisting of tin oxide doped with antimony or cadmium and wherein successively the second layer is electrochemically etched and the first layer is chemically etched so as to obtain a conductive coating of a given configuration.

4,220,515
APPARATUS FOR AUTOMATICALLY DETERMINING THE AMOUNT OF ONE OR MORE SUBSTANCES IN A LIQUID

Casper W. de Kreuk, Bleiswijk, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Nov. 27, 1978, Ser. No. 964,106
Claims priority, application Netherlands, Jan. 10, 1978, 7800279
Int. Cl.[3] G01N *27/34*
U.S. Cl. 204—195 H 3 Claims

1. Apparatus for automatically determining the amount of one or more substances in a liquid by stripping voltammetry, comprising:
a measuring cell;
electrode support means disposed in the measuring cell for supporting a drop of mercury therein as a hanging drop electrode;
a feeding system for delivering liquid to the measuring cell for testing and for delivering mercury in doses to the electrode support means, said feeding system including a pretreatment chamber in which liquid undergoes pretreatment prior to being delivered to the measuring cell for testing;
a discharge system for removing the liquid from the measuring cell after testing;

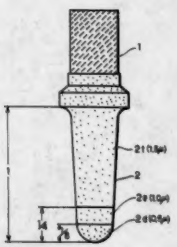


a magnetic stirring device for stirring the liquid in the measuring cell;
a knocking device for knocking the measuring cell thereby to detach the mercury drop from the electrode support means, the deteached mercury drop leaving the cell with the liquid by way of the discharge system; and
a programming circuit for automatically controlling operation of the apparatus, said programming circuit being connected to control operation of the stirring device and the knocking device.

4,220,516
OXYGEN SENSOR

Hiromi Sano, Nagoya, and Masatoshi Suzuki, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 4, 1979, Ser. No. 1,354
Claims priority, application Japan, Jan. 17, 1978, 53-3568
Int. Cl.[2] G01N *27/58*
U.S. Cl. 204—195 S 6 Claims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element, both of said coatings independently being platinum, a platinum alloy or palladium, wherein said second electrode is composed of a plurality of portions, one of which is about 0.5μ thick and forms the thinnest portion, and said portions including said thinnest portion having a thickness gradually increasing by increments of about 0.5μ from said thinnest portion.

4,220,517

OXYGEN CONCENTRATION SENSING APPARATUS

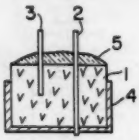
Hitoshi Niwa, Anjo; Naoto Miwa, Tsushima; Masatoshi Suzuki, Kariya, and Masami Ouki, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 28, 1979, Ser. No. 24,773

Claims priority, application Japan, May 16, 1978, 53-58105

Int. Cl.[2] G01N *27/58*

U.S. Cl. 204—195 S **9 Claims**



1. An oxygen concentration sensing apparatus comprising:

a solid electrolyte having oxygen ion conductivity;

a first electrode made of a metal performing catalytic action, said first electrode having a first portion embedded in said electrolyte and a second portion projecting outwardly from the outer surface of said electrolyte;

a second electrode made of a porous metal performing catalytic action, disposed on the outer surface of said electrolyte and separated from said first electrode; and

means for hermetically sealing the intersection of said first electrode and said electrolyte outer surface, said sealing means including a layer of nonconductive, heat-resistant material.

4,220,518

METHOD FOR PREVENTING COKING IN FLUIDIZED BED REACTOR FOR CRACKING HEAVY HYDROCARBON OIL

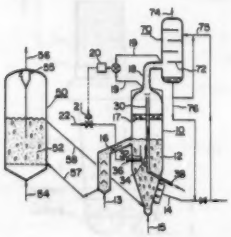
Seiichi Uchida, Urawa; Yoshihito Satomi, Kurashiki; Norihiro Kiuchi, Hachioji; Takeo Yamagata, Takahagi; Susumu Yoshioka, Hitachi; Tomohiko Miyamoto, Takahagi, and Jinichi Tomuro, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Nippon Mining Co., Ltd., both of Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,426

Claims priority, application Japan, Sep. 28, 1977, 52-115538; Sep. 28, 1977, 52-115539; Nov. 7, 1977, 52-132478

Int. Cl.[2] C10G *9/16, 9/28;* C01B *1/09;* B01J *37/14*

U.S. Cl. 208—48 R **17 Claims**



1. In a method for cracking heavy hydrocarbon oil by means of an apparatus comprising a reactor column of fluidized bed type for cracking heavy hydrocarbon oil in a fluidized bed of fluidization particles formed by a fluidization gas passing upwardly therethrough, a regenerator column for burning the fluidization particles with coke deposited during the fluidization in the reactor column, thereby removing the coke from the fluidization particles and recycling the thus regenerated fluidization particles to the reactor column, and a transfer line for transferring a cracked effluent gas of the heavy hydrocarbon oil from the top of the reactor column to a successive treatment, a method for preventing coking in the reactor column of fluidized bed type which comprises using natural ores as the fluidization particles and entraining the fluidization particles in the effluent gas to be passed through the top of the reactor column through the transfer line at a rate of 1–40 g/m^3 of the effluent gas, while circulating a host of the fluidization particles between the reactor column and the regenerator column.

4,220,519

METHOD OF SUPPRESSING THE RISE IN SURFACE TEMPERATURE OF HEATING TUBES BY AMMONIA INJECTION

Kohei Fujita, Ginowan; Youichi Owan, and Minoru Ozawa, both of Naha, all of Japan, assignors to Nippon Petroleum Refining Company, Limited, Tokyo, Japan

Filed Nov. 9, 1978, Ser. No. 959,015

Claims priority, application Japan, Nov. 15, 1977, 52-136253

Int. Cl.[2] C10G *9/16;* C23F *14/02*

U.S. Cl. 208—48 AA **4 Claims**

1. A method of suppressing the rise in surface temperature of heating tubes in a fractionation apparatus for a crude oil which comprises: injecting an aqueous solution of ammonia into the crude oil at the upstream side of the crude heater in an amount of 1 to 20 ppm in terms of ammonia based on the crude oil.

4,220,520

STARTUP METHOD FOR A REFORMING PROCESS

James L. Carter, Westfield, and John H. Sinfelt, Berkeley Heights, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 16, 1978, Ser. No. 961,374

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **16 Claims**

1. In a start-up method for a reforming process wherein a substantially sulfur-free hydrocarbonaceous feed is contacted under reforming conditions in the presence of hydrogen with a bed of a fresh or regenerated catalyst comprising metal components and a refractory support, said metal components being selected from the group consisting of an iridium component and at least one additional metal component selected from the group consisting of ruthenium, rhodium, palladium, osmium, platinum, copper, silver and gold, said metal components being present as clusters having an average size not greater than about 50 Angstroms, said fresh or regenerated catalyst having been reduced by contact with a reducing agent, the improvement which comprises the steps of:

(a) contacting the reduced catalyst with a sulfiding agent in a sulfiding zone such as to provide from about 0.3 to about 2.0 atoms of sulfur per atom of said metal components and, subsequently

(b) contacting the resulting sulfided catalyst with a hydrogen-containing gas at a temperature ranging from about 900° to about 950° F. for a time sufficient to remove the excess sulfiding agent from said sulfiding zone and to distribute said sulfur uniformly throughout said bed prior to contacting said sulfided catalyst with said hydrocarbonaceous feed.

4,220,521
HYDROCARBON DEHYDROCYCLIZATION WITH A SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 907,240, May 18, 1978, Pat. No. 4,157,989, which is a division of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Apr. 26, 1979, Ser. No. 33,655

The portion of the term of this patent subsequent to Aug. 21, 1996, has been disclaimed.

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 23 Claims

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a catalytically effective amount of a halogen component and a uniform dispersion of a catalytically effective amount of a platinum group component maintained in the elemental metallic states.

4,220,522
METHOD OF PROCESSING SOLIDS-CONTAINING OILS OR TARS

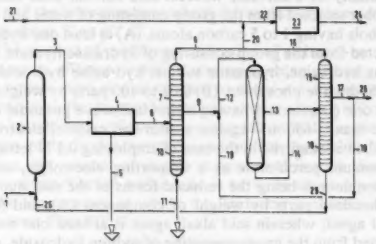
Thomas Simo, Bad Homburg, and Karl H. Eisenlohr, Buchschlag, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 6, 1979, Ser. No. 9,972

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806806

Int. Cl.[2] C10G *1/00, 1/02;* C10B *53/06*

U.S. Cl. 208—177 18 Claims



1. In a method of processing an oil or tar obtained by a dry distillation of oil shale or coal or by the gasification of coal or by the pyrolysis or extraction of tar sand, which oil or tar contains finely dispersed solid material therein wherein the oil or tar is hydrogenated, the hydrogenation product is treated to remove solids and the resultant hydrogenation product free of solids is further processed to a final product, the improvement wherein the hydrogenation of the oil or tar in the presence of said solids is effected in the presence of a naphthene-containing hydrogenated oil.

4,220,523
RECOVERING OF PHOSPHATES FROM PHOSPHATE ORE

J. D. Raulerson, Jr., Bartow, Fla., assignor to Jacobs Engineering Group Inc., Pasadena, Calif.

Filed Jul. 19, 1978, Ser. No. 926,558

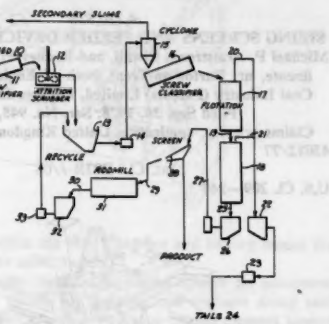
Int. Cl.[2] B03B *7/00*

U.S. Cl. 209—17 8 Claims

1. A process for recovering phosphate values from phosphate ore containing phosphates and silica comprising:

(a) subjecting said phosphate ore, comminuted, to a flotation process which floats finer silica particles, but not coarser silica particles, and does not tend to float phosphates, and removing the floated materials, thereby leaving behind a rougher concentrate;

(b) screening the rougher concentrate from step (a) to remove components of the ore which are of size greater than the sizes of silica particles which were removed by



flotation, and removing from the process the finer product particles which were passed by the screen; and

(c) comminuting the material retained on the screen in step (b) and reintroducing it to step (a), the flotation process of step (a) and the screening process of step (b) constituting the only separative operations imposed on said ore from the introduction of said ore to said flotation process to the completion of the removals defined in step (b).

4,220,524
COLLECTOR AGENT FOR THE RECOVERY OF METAL VALUES IN SULPHIDE ORES BY FROTH FLOTATION

Raul Poblete, Santiago, Chile, assignor to Codelco-Chile, Santiago, Chile

Filed Jan. 13, 1978, Ser. No. 869,050

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 5 Claims

5. In the froth flotation process for treating metallic ores which process includes the treating of said ores with a collector reagent, the improvement comprising said collector reagent being the reaction product resulting from reacting together the following ingredients:

i. gasoline,

ii. methyl isobutyl carbinol, and

iii. ethyl xanthyl ethylformic ester.

4,220,525
BENEFICIATION OF METALLIC ORES BY FROTH FLOTATION USING POLYHYDROXY AMINE DEPRESSANTS

Vojislav Petrovich, 1935 W. Schiller St., Chicago, Ill. 60622

Filed Dec. 28, 1978, Ser. No. 974,030

Int. Cl.[2] B03D *1/06*

U.S. Cl. 209—167 1 Claim

1. In concentration by froth flotation of metallic ores mixed with gangue minerals selected from the groups of silica, silicates, carbonates, sulfates, and phosphates, which includes the subjecting of such ore material when finely ground to froth flotation process; the step of adding to the mineral slurry an amount of the order of 0.05 kg per ton of ore treated with polyhydroxy amine wetting and depressing agents for silica, silicates, carbonates, sulfates, and phosphates; said polyhydroxy amines selected from the class containing one NH_2 group and from 3 to 7 hydroxyl groups having one or other of the following formulas:

1. $HOCH_2(CHOH)_n(H_2NH_2$

2. $HOCH_2(CHOH)_nCH(NH_2)CHO$

where n is an integer from 2 to 6, said polyhydroxy amines being adapted to react with the gangue material of the mineral slurry, depress the gangue material inhibiting it to float in the froth, while the metallic minerals nonresponsive to polyhydroxy amines may be floated and collected with adequate collectors.

4,220,526

SIZING SCREENS AND FEEDER DEVICES THEREFOR

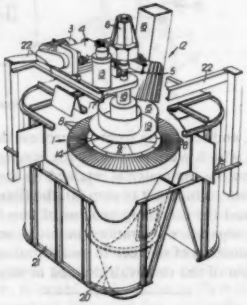
Michael P. Armstrong, Etwall, and Rodney W. O'Brian, Swadlincote, nr. Burton-on-Trent, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Sep. 26, 1978, Ser. No. 945,864

Claims priority, application United Kingdom, Oct. 10, 1977, 42012/77

Int. Cl.² B07B 1/08

U.S. Cl. 209—240 **6 Claims**



1. A sizing screen for particulate material of different sizes comprising a circular screen surface having a plurality of elongate radially projecting rod members, drive means for rotating the screen surface, first collection means positioned adjacent to the outer periphery of the screen surface for collecting an oversize fraction of the particulate material, second collection means positioned below the screen surface for collecting an undersize fraction of the particulate material and feeder means for feeding the particulate material onto the screen surface, the feeder means comprising a particulate material dispersing chute, a generally continuously spirally shaped stationary plough positioned below the chute, and a rotatable table onto which material is fed from the chute and which is positioned below the plough and which is rotatable with respect thereto, the table moving the material with respect to the plough such that the particulate material moving on the table is pushed by the plough uniformly over the edge of the rotating table substantially around the whole table circumference to provide a uniform feed of said particulate material onto the circular screen surface.

4,220,527

METHOD OF CLEANING PHOSPHORUS-CONTAINING WASTE WATER BY MICROORGANISMS

Shigezo Udaka, and Makoto Shoda, both of Nagoya, Japan, assignors to President of Nagoya University, Aichi, Japan

Filed Jan. 17, 1979, Ser. No. 4,285

Claims priority, application Japan, Jan. 23, 1978, 53-6061

Int. Cl.² C02B 1/06

U.S. Cl. 210—12 **5 Claims**

1. A method of cleaning phosphorus-containing waste water with microorganisms, which comprises, cultivating in said waste water one or more microoganisms of *Arthrobacter globiformis, Arthrobacter simplex, Micrococcus luteus, Micrococcus varians, Nocardia erythropolis, Nocardia restrictus, Cellulomonas uda, Cellulomonas biazotea, Oerskovia turbata, Oerskovia xanthineolytica, Corynebacterium bovis, Corynebacterium aquaticum, Brevibacterium linens, Brevibacterium imperiale* and *Kurthia zopfii* or mutants or variants thereof capable of efficiently accumulating organic and/or inorganic phosphorus compounds, the pH of said waste water being maintained at about 3 to 10 and the temperature of said waste water being maintained at about 25° to 40° C. during said cultivation, allowing the microorganisms to accumulate said organic and/or inorganic phosphorus compounds therein and then separating the microorganisms.

4,220,528

PROCESS FOR DISOXIDATING GAS OR WATER

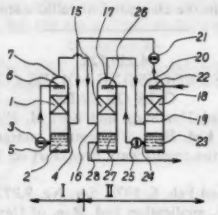
Masao Matsumoto, and Isao Manabe, both of Tokushima, Japan, assignors to Otsuka Chemical Co., Ltd., Osaka, Japan

Filed Sep. 29, 1978, Ser. No. 946,737

Claims priority, application Japan, Oct. 5, 1977, 52/120280; Mar. 14, 1978, 53/29568

Int. Cl.² C02B 1/10

U.S. Cl. 210—758 **19 Claims**



1. A process for disoxidating a gas which comprises contacting a gas being inert to hydrazines with a solution consisting essentially of a solvent, wherein said solvent is at least one member selected from the group consisting of water and lower alcohols having 1 to 5 carbon atoms, (A) at least one hydrazine selected from the group consisting of hydrazine hydrate, anhydrous hydrazine, hydrazine sulfate, hydrazine hydrochloride, and hydrazine phosphate, (B) 0.01 to 100 parts by weight of at least one (i) quinones having a first half-wave potential of not more than −650 mV against a saturated calomel electrode at 25° C. in acetonitrile in the case of employing 0.1 N tetraethylammonium perchlorate as a supporting electrolyte, and (ii) hydroquinones being the reduced forms of the said quinones, per hundred parts by weight of component (A), and (C) an alkali agent; wherein said alkali agent is at least one member selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, sodium carbonate, potassium carbonate, sodium phosphate, potassium phosphate, and ammonia, components (A), (B) and (C) being present in amounts effective for disoxidating the gas.

8. A process for disoxidating water which comprises the following steps of:

(I) disoxidating a gas containing oxygen which is inert to hydrazines and water by contacting the gas with a solution consisting essentially of a solvent, wherein said solvent is at least one member selected from the group consisting of water and lower alcohols having 1 to 5 carbon atoms, (A) at least one hydrazine selected from the group consisting of hydrazine hydrate, anhydrous hydrazine, hydrazine sulfate, hydrazine hydrochloride, and hydrazine phosphate, (B) 0.01 to 100 parts by weight of at least one of (i) quinones having a first half-wave potential of not more than −650 mV against a saturated calomel electrode at 25° C. in acetonitrile employing 0.1 N tetraethylammonium perchlorate as a supporting electrolyte, and (ii) hydroquinones being the reduced forms of the said quinones per 100 parts by weight of component (A), and (C) an alkali agent, wherein said alkali agent is at least one member selected from the group consisting of sodium

hydroxide, potassium hydroxide, lithium hydroxide, sodium carbonate, potassium carbonate, sodium phosphate, potassium phosphate, and ammonia,

(II) contacting the disoxidated gas with water containing dissolved oxygen to remove a major portion of the oxygen from the water, and

(III) removing the oxygen remaining in the treated water by adding a nonvolatile disoxidant to the water, the amount of the disoxidant being effective for removing the residual oxygen.

4,220,529

OXIDATIVE PURIFICATION OF WATER

Marie-Christine Daude-Lagrave, Paris, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jun. 23, 1976, Ser. No. 698,853
Claims priority, application France, Aug. 22, 1975, 75 25974
Int. Cl.[2] C02C *5/04*
U.S. Cl. 210—758 **4 Claims**

1. The method of oxidative purification of a cyanide-containing aqueous effluent water source comprising treating said water source with singlet oxygen to carry out the oxidative purification to the degree desired, the singlet oxygen is formed in situ by adding to said water source substantially equimolar amounts of hydrogen peroxide and sodium hypochlorite or bromine, the amount of singlet oxygen used is about 20% to 40% in excess of the stoichiometric amount required to react with the cyanide, and the temperature at which the oxidation is carried out is from about 5° to 80° C.

3. The method of oxidative purification of a cyanohydrin-containing aqueous effluent water source comprising treating said water source with singlet oxygen to carry out the oxidative purification to the degree desired, the singlet oxygen is formed in situ by adding to said water source substantially equimolar amounts of hydrogen peroxide and sodium hypochlorite or bromine, the amount of single oxygen used is such that the singlet oxygen/CN^- molar ratio is between about 2 and 3, and the temperature at which the oxidation is carried out is from about 5° to 80° C.

4. The method of oxidative purification of a phenol-containing aqueous effluent water source comprising treating said water source with singlet oxygen to carry out the oxidative purification to the degree desired, the singlet oxygen is formed in situ by adding to said water source substantially equimolar amounts of hydrogen peroxide and sodium hypochlorite or bromine, the amount of singlet oxygen used is such that the single oxygen/phenol molar ratio is between about 4 and 10, and the temperature at which the oxidation is carried out is from about 5° to 80° C.

4,220,530

FISH TANK FILTER

Raymond S. Gabriele, 1715 N. Long Ave., Chicago, Ill. 60639

Filed May 29, 1979, Ser. No. 42,813
Int. Cl.[2] B01D *35/14*; E04H *93/20*
U.S. Cl. 210—86 **3 Claims**

1. A filtering device, particularly for use in filtering aquarium water comprising:

a tank having an inlet, outlet and intervening communication chambers;

filtering means within each chamber in intercepting relation to the flow of contaminants and water from the inlet to the outlet chambers;

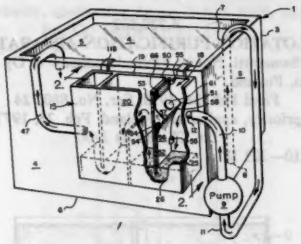
said chambers being defined by baffles arranged to provide a labyrinthian flow path between said chambers;

a first of said baffles being spaced from the bottom of the tank and a second of said baffles extending from the bottom and terminating short of the top of the tank, whereby the water is caused to flow beneath said first baffles and over the second baffles,

said chambers having bottom portion and said filtering means filling said bottom portion above the lower ends of the first baffles and below the upper ends of the second baffles;

indicia means supported in said tank and operative to indicate sludging conditions in said filtering means,

said indicia means comprising a vertically slidable element



mounted within the inlet chamber and having means for adjusting the draft thereof,

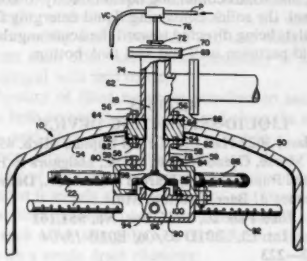
and said element slidably supported against an associated baffle, and means for guiding said element along said associated baffle, and an envelope on said element having means for sealing and opening the same.

4,220,531

APPARATUS FOR DEIONIZING LIQUIDS WITH ION EXCHANGE RESINS

Herbert D. Robison, Norwood, Mass., assignor to Gordon B. Nute, South Weymouth, Mass., a part interest

Filed Apr. 14, 1978, Ser. No. 896,400
Int. Cl.[3] B01D *15/04*
U.S. Cl. 210—189 **23 Claims**



1. An ion exchange vessel assembly for primary, fixed-bed demineralizers, such assembly being operable for demineralizing an influent fluid flow and comprising:

an ion exchange vessel;

a quantity of ion exchange resin disposed within the exchange vessel;

distributor means for providing fluid communication between the interior of the exchange vessel and piping exterior to the vessel, such distributor means permitting the resin to substantially occupy the interior volume of the exchange vessel when the assembly is operated for demineralization of the influent fluid flow;

an auxiliary vessel operative in association with the exchange vessel for receiving a predetermined portion of the ion exchange resin from the exchange vessel when the assembly is operated to backwash the resin;

means for transferring ion exchange resin between the exchange vessel and the auxiliary vessel; and

the distributor means comprising a spider distributor having a main conduit, a first set of laterally disposed conduits in fluid communication with the main conduit and with the

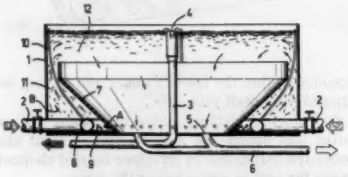
interior of the exchange vessel; a second set of laterally disposed conduits in fluid communication with the interior of the exchange vessel, and means responsive to a control signal supplied thereto for selectively establishing fluid communication between the second set of laterally disposed conduits and the main conduit.

4,220,532

FLOTATION PURIFICATION APPARATUS

Pekka T. Sammatti, Nokia, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed Feb. 24, 1978, Ser. No. 880,724
Claims priority, application Finland, Feb. 25, 1977, 770618
Int. Cl.[2] B03D *1/00*
U.S. Cl. 210—221 R **4 Claims**



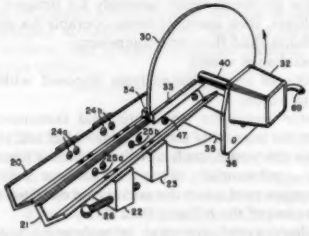
1. A purification apparatus for separation of solids from solids containing liquids comprising a flotation tank having outlet means for separated solids and outlet means for pruified liquid, an upwardly widening partition wall extending upwardly from the bottom of said tank and forming a retardation chamber within said tank, the outer surface of said partition wall forming an acute angle with said tank bottom, a distributing channel surrounding said partition wall and having outlet openings facing the juncture between said partition wall and said tank bottom, inlet means for said solids containing liquid conducting said solids containing liquid directly to said distributing channel, the solids containing liquid emerging from said channel outlets being directed toward the acute angular corner between said partition wall and said tank bottom.

4,220,533

LIQUID-SEPARATING DEVICE

Harold J. Baer, 3022 Hall SE., Grand Rapids, Mich. 49506, and Glenn B. Morse, Grand Rapids, Mich., assignors to Harold J. Baer, Grand Rapids, Mich.; Harold J. Baer, Jr., Denver, Colo. and Lawrence J. Baer, Crotton, Md.

Filed Feb. 20, 1975, Ser. No. 551,161
Int. Cl.[2] B01D *35/06*; E02B *15/04*
U.S. Cl. 210—223 **1 Claim**



1. A machine for elevating liquid material, said machine including frame means and plate means rotatably mounted on said frame means, and also including wiping means and collector means adapted to remove liquid from said plate means, and drive means adapted to rotate said plate means, wherein the improvement comprises:

at least two plates constituting said plate means mounted respectively on spaced axis of rotation and in overlapping relationship;

bracket means interposed between said plate, and mounted on said frame, said bracket means having a receptacle slot, and said wiping means is a flexible strip normally received in said slot and engaging said overlapping plates along the opposite edges of said strip, said bracket means constituting the sole supporting and retaining means for said strip, said drive means being operative to induce a common direction of rotation of said plates; and wherein

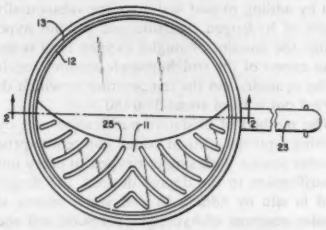
said slot is normally inclined to the horizontal, and has a serrated edge on the side thereof facing the direction of rotation of one of said plates, and said one plate is mounted below the other of said plates.

4,220,534

FOOD STRAINING

Joseph F. Perry, 185 York St., Stoughton, Mass. 02072

Filed Oct. 4, 1978, Ser. No. 948,404
Int. Cl.[2] B01D *23/20, 35/02*
U.S. Cl. 210—232 **2 Claims**



1. Food straining apparatus for being detachably secured to a conventional pot or pan comprising,

grill means formed with a perforated portion for partially covering the opening of a conventional pot or pan for passing liquids while obstructing solids and having a periphery formed with a lower groove for snug engagement with the upper lip of a standard pot or pan and an upper groove for accommodating the lower lip of a cover for that pot or pan,

said upper and lower grooves being formed in an annular ring,

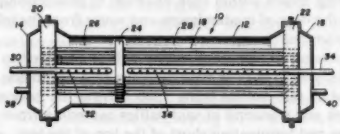
said perforated portion being detachably secured to said ring and comprising a snap-in grill engaging said ring in a tongue-in-groove relationship.

4,220,535

MULTI-ZONED HOLLOW FIBER PERMEATOR

Richard L. Leonard, Decatur, Ala., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 4, 1978, Ser. No. 931,049
Int. Cl.[2] B01D *31/00*
U.S. Cl. 210—321 R **15 Claims**



1. A permeator for separating by the selective permeation of at least one fluid from a fluid mixture containing at least one other fluid comprising an elongated, fluid impermeable shell

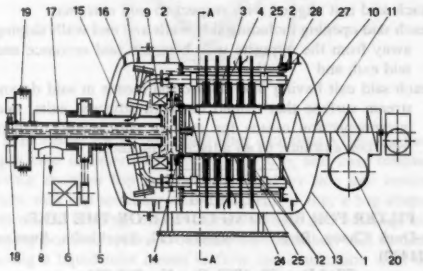
having at least one end adapted to receive a tube sheet; a plurality of selectively permeable hollow fibers, said hollow fibers having an exterior surface and a bore and said hollow fibers being generally parallelly positioned within the shell to form an elongated bundle of hollow fibers; at least one tube sheet, said tube sheet being in fluid tight relationship with the shell wherein at least one end of each of said hollow fibers is embedded in a fluid tight relationship in said at least one tube sheet and wherein the bores of said hollow fibers communicate through said tube sheet; at least one essentially fluid impermeable partition in said shell transverse to the longitudinal orientation of the hollow fibers to provide zones in said shell, there being provided an initial zone and at least one subsequent zone; means to enable fluid flow between adjacent zones wherein said means and said partition are adapted to provide the fluid flow in each of said zones which is primarily transverse to the orientation of the hollow fibers in the zone; fluid ingress means adapted to provide fluid flow into said shell to the exterior of said hollow fibers in said initial zone; longitudinally distant fluid egress means adapted to provide fluid flow from the exterior of said hollow fibers out of said sheel from a subsequent zone wherein said initial zone is significantly smaller in available membrane surface area to effect said fluid separation than the available membrane surface area in an at least one subsequent zone.

4,220,536

APPARATUS FOR FILTERING LIQUIDS

Martin Dosoudil, Alkmaar, Netherlands, assignor to Amafilter BV, Alkmaar, Netherlands

Filed Apr. 27, 1979, Ser. No. 34,033
Int. Cl.² B01D *33/02*
U.S. Cl. 210—325 **14 Claims**



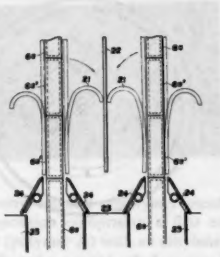
1. An apparatus for filtering liquids, comprising a substantially cylindrical shaped and horizontally disposed filter casing in which, substantially perpendicular to the axis of the casing, a number of disc shaped filter elements is mounted, characterized, in that at least one supporting member is journaled in the casing for rotation relative thereto and substantially about the axis of the casing, said supporting member being provided with a number of hollow rotating shafts evenly spaced around its axis of rotation, each of said hollow rotating shafts carrying at least one filter element arranged to direct the filtrate discharge from said filter element through its associated hollow rotating shaft to an outlet conduit mounted stationary with respect to said supporting member, and a conveying trough having a conveying screw arranged substantially in alignment with the axis of rotation of said supporting member for transporting the filter cake dislodged from the filter elements and received by the trough out of the filter casing.

4,220,537

DRUM TYPE DISC FILTER DEVICE FOR PAPER PULP SLURRY

Risaburo Takahashi, and Mitsuo Takahashi, both of Fiji, Japan, assignors to Seicho Machinary Co., Ltd., Fuji, Japan

Filed Dec. 5, 1978, Ser. No. 966,756
Claims priority, application Japan, Jul. 3, 1978, 53-80764
Int. Cl.² B01D *25/34, 33/36*
U.S. Cl. 210—333 R **1 Claim**



1. A drum type disc filter device for dehydrating paper pulp slurry, comprising:

(a) a vat;

(b) a shaft rotatably mounted within said vat;

(c) a rotatable drum mounted on said shaft within said vat;

(d) a plurality of drain chambers located on the outer surface each extending along the drum and said chambers being adjacent each other around the periphery of said drum, and integral with said drum;

(e) a plurality of filter members attached to said rotating drum, both around the periphery and along the axis of said drum, said filter members being attached to other filter members around the periphery of said drum to form a plurality of filter discs surrounding said drum and located at spaced intervals along the axis of said drum, said individual filter members of said filter discs which are aligned with each other along the axis of said drum, communicating with a single drain chamber;

(f) fluid suction pressure means successively connected to said drain chambers as said drain chambers are rotated by said drum through said paper pulp slurry, for causing paper pulp to attach itself to said portion of said filter discs communicating with said drain chambers which are submersed in the said paper pulp slurry;

(g) air pressure means for successively introducing pressurized air into one of said drain chambers as said drum is rotated into a predetermined position of rotation, wherein said drain chambers having pressurized air introduced into them are positioned outside of said vat and past the upper center position of rotation of said drum for separating said paper pulp which is attached to corresponding filter disc filter members;

(h) an exit chute for removing said paper pulp from said vat and filter discs; and

(i) paper guide plates fixedly secured between adjacent filter discs at said predetermined position of rotation wherein said paper pulp is separated, said paper pulp being separated as individual cakes from said filter members, said paper guide plates preventing blockage of said chute and lumping of said paper pulp cakes with each other.

4,220,538

BATCH CENTRIFUGE WITH SCRAPER KNIFE MOUNTED ON INLET TUBE

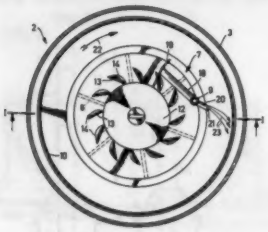
Kurt Zeppenfeld, Munich, and Klaus D. Koch, Vierkirchen, both of Fed. Rep. of Germany, assignors to Krauss-Maffei, Munich, Fed. Rep. of Germany

Filed Nov. 20, 1978, Ser. No. 962,154

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803130

Int. Cl.[2] B01D *33/10, 35/16*

U.S. Cl. 210—375 10 Claims



1. A centrifuge comprising:

a support;

a basket generally centered on a basket axis and rotatable relative to said support about said basket axis;

a support member movable axially in said basket and pivotal between a pair of end positions about a member axis offset from said basket axis;

a fill tube fixed on said support member and jointly displaceable and pivotal therewith, said fill tube being directed generally radially outwardly relative to said basket axis at said basket in one of said end positions;

means for introducing a suspension to be centrifuged into said basket through said fill tube in said one end position thereof;

an unloading knife fixed on said support member and jointly displaceable and pivotal therewith, said unloading knife being closely juxtaposed with said basket in the other of said end positions and being widely spaced from said basket in said one end position; and

means for pivoting said support member about said member axis between said end positions and thereby jointly pivoting said fill tube and said knife about said member axis.

4,220,539

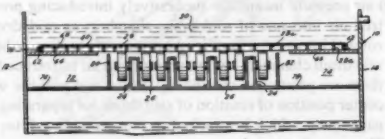
EDGE SEALS FOR LIQUID FILTERS

Wilfred J. Lee, East Syracuse, N.Y., assignor to Clarkson Industries, Inc., New York, N.Y.

Filed Feb. 26, 1979, Ser. No. 14,831

Int. Cl.[2] B01D *33/22*

U.S. Cl. 210—401 8 Claims



1. A flat bed filter comprising side walls, an endless link mesh conveyor belt, means for supporting said conveyor and moving it horizontally between said side walls, a sheet of filter medium resting on said conveyor and movable therewith, said side walls, conveyor and filter medium cooperating to define a trough adapted to contain a pool of liquid to be filtered, a compartment below said conveyor for collecting liquid passing through said filter medium and conveyor, said side walls being provided with substantially horizontal liquid impervious shelves extending therealong and positioned below and in supporting contact with opposite edge portions of said conveyor, the links of said conveyor forming a plurality of transversely spaced dams extending lengthwise along each side of said conveyor and frictionally engaging the tops of said shelves as said conveyor moves therealong to cause said transversely spaced dams to provide an obstructed leakage path and thereby minimize leakage from said pool around the edges of said conveyor to said compartment.

4,220,540

FILTERING SCRAPER

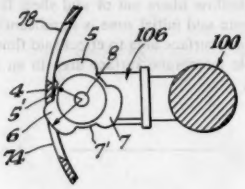
Tadashi Hagihara, 4-1, 5-chome, Minami Nagasaki, Toshima-ku, Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 14,867

Claims priority, application Japan, Sep. 18, 1978, 53-114361

Int. Cl.[2] B01D *23/24*

U.S. Cl. 210—415 12 Claims



1. In a filter cleaning system, a filter comprising:

a body of sheet material having a generally broad upstream surface and downstream surface with a plurality of individual, spaced apart, long, narrow through openings,

each said opening having an entrance on said upstream surface and an exit on said downstream surface with said exits being larger than each said entrance,

each said exit aligned with respect to said entrance,

each said opening including side walls and end walls sloping away from the opposite wall between said entrance and said exit, and

each said exit having interconnection means in said downstream surface that extend between adjacent exits, said interconnection means for guiding slit-cleaning fingers from one entrance to an adjacent entrance.

4,220,541

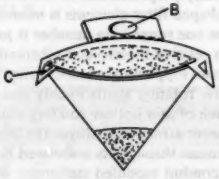
FILTER FOR BREWING COFFEE OR THE LIKE

Soo-Duck Chang, Birger Jarlsgaten 112, Stockholm, Sweden (11420)

Filed Dec. 28, 1977, Ser. No. 865,204

Int. Cl.[2] B01D *23/02*

U.S. Cl. 210—474 1 Claim



1. Filter for brewing coffee, tea or the like, intended to throw-away use and for being used without a supporting holder, consisting of a carton having the form of an annular

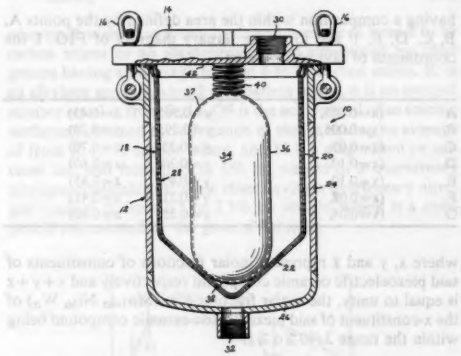
disc having a sector quadrant removed when being in a flat position and having a funnel-shaped form when being erected, and a circular filter paper being placed concentrically on the inside of the carton whereby water is able to pour through the filter in the center area; wherein a recess of triangular form is formed in the outer periphery of the carton, an apex of the recess being directed radially outwards, whereby in erected position of the carton the peripheral area of the carton can be folded along a peripheral line through the recesses so that a collar is formed around the carton.

4,220,542

FILTER HAVING AN INTERIOR LIQUID DISPLACEMENT MEANS

Howard W. Morgan, Jr., Michigan City, Ind., assignor to Filter Specialists, Inc., Michigan City, Ind.

Filed Feb. 23, 1979, Ser. No. 14,267
Int. Cl.² B01D 23/04
U.S. Cl. 210—474 **3 Claims**



1. In a filter for a liquid, said filter including a housing having a base member and a removable cap, said base member having an open top and being defined by side and bottom walls, said cap spanning said base member top, a bag-shaped reticulated filtering means carried within said housing and having portions spaced from said base member, said housing having a liquid inlet means in flow communication with the interior of said filtering means and a liquid outlet means in said base member in flow communication with said spaced filtering means portions, a removable closed container means for decreasing the volumetric interior size of said filtering means, said container means fitting within said filtering means and having parts spaced from said filtering means to define liquid flow passage means from said inlet means to said spaced filtering means portions wherein liquid in passing through said filter from said inlet means to said outlet means will flow around said container means, said filtering means including an end wall and an open top, said container means having an end wall, said cap overlying the top of said filtering means, the improvement comprising biasing means interposed between said container means and cap for urging said container means end wall against said filtering means end wall, said outlet means opening into said base member at a location below where said container means end wall is urged by said biasing means against said filtering means end wall.

4,220,543

ETHYLENE-VINYL ALCOHOL MEMBRANES HAVING IMPROVED PROPERTIES AND A METHOD OF PRODUCING THE SAME

Shuzo Yamashita, Kurashiki, Japan, assignor to Kuraray Co., Ltd., Kurashiki, Japan

Continuation-in-part of Ser. No. 938,484, Aug. 31, 1978, abandoned. This application Nov. 22, 1978, Ser. No. 962,962
Claims priority, application Japan, Sep. 6, 1977, 52/108251
Int. Cl.² B29D 27/04
U.S. Cl. 210—500 M **5 Claims**

1. An ethylene-vinyl alcohol copolymer membrane which consists of a composition comprising a first ethylene-vinyl alcohol copolymer (polymer A) with an ethylene unit content of 20 to 90 mole % and a second ethylene-vinyl alcohol copolymer (polymer B) with an ethylene unit content of 1 to 20 mole %, the difference between said two ethylene unit contents of the copolymers being not less than 5 mole %, and said polymer A and said polymer B being present in a weight ratio (A/B) of 95/5 to 50/50.

3. A method of producing EVA copolymer membrane which comprises extruding a dope into a coagulation bath consisting essentially of water at a temperature between −15° and 80° C., wherein said dope comprises a composition containing a first ethylene-vinyl alcohol copolymer (polymer A) with an ethylene unit content of 20 to 90 mole % and a second ethylene-vinyl alcohol copolymer (polymer B) with an ethylene unit content of 1 to 20 mole %, the difference between said two ethylene unit contents of the copolymers being not less than 5 mole %, and said polymer A and said polymer B being present in a weight ratio (A/B) of 95/5 to 50/50, and a solvent selected from the group consisting of dimethylsulfoxide, dimethylacetamide, methylpyrrolidone, pyrrolidone and mixtures thereof, whereby said polymers are dissolved therein at a concentration of 10 to 40 weight %, and recovering the resulting membrane from the coagulation bath.

4,220,544

APPARATUS FOR COALESCING

Jay L. McGrew, Littleton, Colo., assignor to Marine Construction & Design Co., Seattle, Wash.

Continuation of Ser. No. 863,078, Dec. 22, 1977, abandoned, which is a division of Ser. No. 766,027, Feb. 2, 1977, Pat. No. 4,083,778, which is a continuation of Ser. No. 566,926, Apr. 10, 1975, abandoned. This application May 21, 1979, Ser. No. 41,253
Int. Cl.² B01D 17/04
U.S. Cl. 210—526 **9 Claims**

1. Apparatus for coalescing emulsified oil in an emulsified oil/water mixture to produce coalesced oil/water mixture therefrom, comprising:

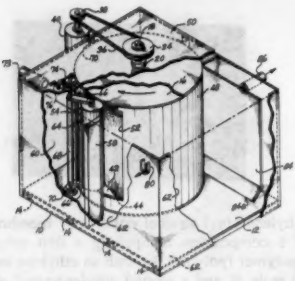
container means including a first compartment adapted to receive and hold emulsified oil/water mixture, a second compartment adapted to receive and hold coalesced oil/water mixture substantially at the level of mixture in the first compartment, and a mixture transfer compartment adapted to hold mixture at said level extending between said compartments and affording a mixture transfer path therebetween,

an elongated endless belt of resiliently compressible open-pore foam material having oleophilic, hydrophobic pore wall surfaces,

means guiding the belt in an endless generally horizontal path of motion passing recurringly and successively through said first and second compartments and said mixture transfer compartment while continuously immersed in mixture to such level,

means at a first station along said path in said first compartment operable on the belt to effect ingestion of emulsified oil/water mixture into the open pores of the belt material as it passes such station.

means at a second station along said path in said second



compartment operable on the belt to force ingested mixture from the belt material as it passes said second station, and drive means operable to advance the belt in said endless path at a controlled rate related to the path distance between said stations so as to afford time for emulsion particles of the oil in the ingested mixture to coalesce by gravity settling on said pore wall surfaces in the belt material while the same is advancing from said first station to said second station and through said mixture transfer compartment, whereby oil in the mixture forced from the belt at said second station is coalesced.

4,220,545

IONIZATION CHAMBER FOR CHEMICAL IONIZATION

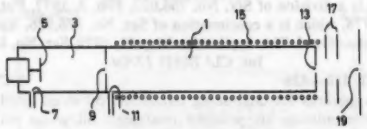
Jochen Franzen, Wildeshausen, and Gerhard Weiss, Varrel, both of Fed. Rep. of Germany, assignors to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft, Bremen, Fed. Rep. of Germany

Filed Aug. 21, 1978, Ser. No. 935,131

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737852

Int. Cl.² H01J *37/08*

U.S. Cl. 250—530 **9 Claims**



1. An ionization chamber for the chemical ionization of vapors of a substance in ion-molecule reactions by means of ionizing primary particles and a reactance gas comprising:

an elongated chamber having at least one inlet opening for feeding the substance vapor, the reactance gas and the ionizing primary particles and at least one outlet opening for the reaction products formed in the chamber, said inlet opening for the ionizing primary particles and said outlet opening for the reaction products being arranged in alignment in opposite end walls of said chamber.

4,220,546

PIEZOELECTRIC CERAMIC COMPOUNDS

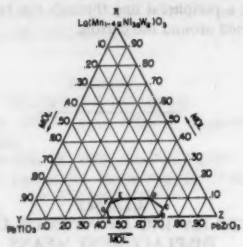
Hiroshi Satomura, Hatogaya, and Katsuyoshi Takano, Tokyo, both of Japan, assignors to Toko, Inc., Tokyo, Japan

Filed Jul. 16, 1979, Ser. No. 57,724

Claims priority, application Japan, Jul. 25, 1978, 53-89933

Int. Cl.² C04B *35/46, 35/48, 35/50*

U.S. Cl. 252—62.9 **1 Claim**



1. A ternary system piezoelectric ceramic compound represented by a molecular formula

$$xLa(Mn_{1-4\alpha}\ Ni_{3\alpha}\ W_{\alpha})O_3 - yPbTiO_3 - zPbZrO_3$$

having a composition within the area defined by the points A, B, C, D, E, F and G in the ternary diagram of FIG. 1 the coordinates of said points being:

A	(x=0.005,	y=0.565,	z=0.43)
B	(x=0.005,	y=0.295,	z=0.70)
C	(x=0.05,	y=0.25,	z=0.70)
D	(x=0.10,	y=0.30,	z=0.60)
E	(x=0.10,	y=0.45,	z=0.45)
F	(x=0.08,	y=0.51,	z=0.41)
G	(x=0.05,	y=0.55,	z=0.40)

where x, y and z represent molar fractions of constituents of said piezoelectric ceramic compound respectively and x+y+z is equal to unity, the molar fraction α in $(Mn_{1-4\alpha}\ Ni_{3\alpha}\ W_{\alpha})$ of the x-constituent of said piezoelectric ceramic compound being within the range $3/40 \leqq \alpha \leqq \frac{1}{4}$.

4,220,547

DIELECTRIC PASTE FOR THICK FILM CAPACITOR

Katsuo Abe; Noriyuki Taguchi, both of Yokohama; Nobuyuki Sugishita, Yokosuka, and Tokio Isogai, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 19, 1978, Ser. No. 971,106

Claims priority, application Japan, Dec. 21, 1977, 52-152872

Int. Cl.² H01B *3/12*

U.S. Cl. 252—63.5 **1 Claim**

1. A dielectric paste, which comprises 100 parts by weight of a uniform mixture of inorganic powder consisting of 82.5–92.0% by weight of barium titanate powder, 0.5–15% by weight of glass frit of bismuthate, and 2.5–7.5% by weight of magnetite powder, 1–50 parts by weight of an organic vehicle, and 0.25–5 parts by weight of a surface-active agent, a dielectric constant being higher than 1100 at a firing temperature of 900° C. or less, and wherein the barium titanate powder has an average particle size of 1–2 μm, the glass frit of bismuthate has an average particle size of 1–2 μm and a composition of 75.1–80% by weight of Bi_2O_3, 6.5–11.0% by weight PbO, and 3.5–6.7% by weight of SiO_2, the balance being B_2O_3 and BaO, or a composition of 75.1–80% by weight of Bi_2O_3,6.5–11.0% by weight of PbO, and 3.5–6.7% by weight of SiO_2, the balance being B_2O_3, Al_2O_3 and CaO, the surface-active agent is at least one compound selected from sodium oleate, sodium alkylbenzene, sulfonate, and polyoxyethylene monolaurate, and the

magnetite powder has an average particle size of 0.02 μm or less.

4,220,548

SHAMPOO COMPOSITION COMPRISING CALCIUM OR MAGNESIUM ANIONIC SURFACTANTS AND QUATERNARY NITROGEN-CONTAINING CELLULOSE ETHERS

Shigeru Hashimoto, Chiba, and Toru Ono, Kasukabe, both of Japan, assignors to The Lion Fat and Oil Co., Ltd., Tokyo, Japan

Filed Apr. 10, 1978, Ser. No. 895,033
Claims priority, application Japan, Apr. 15, 1977, 52-43198
Int. Cl.² C11D *1/65, 1/14, 3/48*
U.S. Cl. 252—106 **13 Claims**

1. A shampoo composition comprising from 3 to 50% by weight of at least one anionic surfactant, selected from the group consisting of the compounds represented by the formulas:

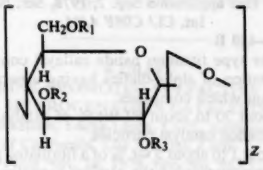
$$R\text{-}(OR')_nOSO_3M_{\frac{1}{2}} \quad (I),$$

$$R\text{-}SO_3M_{\frac{1}{2}} \quad (II),$$

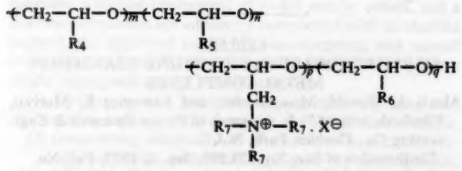
and

$$OS\text{-}M_{\frac{1}{2}} \quad (III)$$

wherein R is an alkyl group having an average of from 8 to 18 carbon atoms or an alkylphenyl group substituted by alkyl groups having an average of from 6 to 15 carbon atoms, R' is an alkylene group having 2 or 3 carbon atoms, n is an integral number equal to from 0 to 6, OS is the acid radical of an anionic surfactant obtained by sulfonation of olefins having an average of from 10 to 18 carbon atoms, and M is a magnesium or calcium ion; and from 0.05 to 5% by weight of a quarternary nitrogen-containing cellulose ether having a quarternary nitrogen content of from 0.5 to 3.5% by weight which is a compound represented by the general formula:



where R_1, R_2' and R_3 each are hydrogen or a substituent group of the formula:



wherein R_4, R_5, R_6, R_7, m, n, p and q in one substiuent group may be different from those in another substituent group; m, n and q are integral numbers of from 0 to 10; p is an integral number of from 0 to 3; R_4, R_5 and R_6 are hydrogen atoms or methyl groups, R_7 is a methyl, ethyl or propyl; X is a halogen atom; and Z is a number of from 100 to 20,000; and the sum of (m+n+q) has an average value of from 1 to 3 per glucose unit and p has an average value of from about 0.1 to 0.8 per glucose unit.

4,220,549

METHOD FOR REMOVING REFLECTIVE DECAL

Ronnie J. Moore, Columbus, and Walter H. Burrows, Atlanta, both of Ga., assignors to Ronnie J. Moore, Smyrna, Ga.

Filed May 4, 1978, Ser. No. 902,801
Int. Cl.² C11D *7/52*
U.S. Cl. 252—171 **8 Claims**

1. A method of removing acrylic and polyester reflective decals from a surface comprising the steps of:

contacting said decal, for a period of time sufficient to loosen said decal from said surface, with a composition consisting essentially of approximately 30%—70% by weight methylene chloride and approximately 10%—40% by weight methyl alcohol; and

separating said loosened decal from said surface.

4,220,550

COMPOSITION AND METHOD FOR REMOVING SULFIDE-CONTAINING SCALE FROM METAL SURFACES

Wayne W. Frenier, Tulsa; Michael D. Coffey, Jenks; James D. Huffines, Bixby, all of Okla., and Donald C. Smith, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1978, Ser. No. 967,047
Int. Cl.² C02B *5/06, 1/18*
U.S. Cl. 252—180 **21 Claims**

1. A method of chemically cleaning acid-soluble, sulfide-containing scale from a metal surface comprising contacting said scale with an aqueous acid cleaning composition comprising an aqueous non-oxidizing acid having at least one aldehyde dissolved or dispersed therein, which aldehyde is present in an amount at least sufficient to prevent or substantially prevent the evolution of hydrogen sulfide gas.

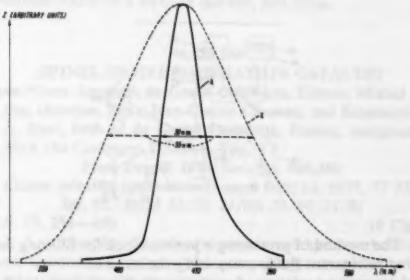
8. An aqueous acid composition comprising an aqueous acid having dissolved or dispersed therein at least one aldehyde; said composition having, as one of its chemical properties, the capability of dissolving acid-soluble, sulfide-containing scale from a metal surface without the evolution of hydrogen sulfide gas, provided that the aldehyde is present in excess of the acid required to dissolve the sulfide containing scale.

4,220,551

NOVEL BLUE LIGHT EMITTING LUMINOPHORS

Claude Fouassier, Gradignan; Alain Garcia, Passage 'Agen, and Bertrand Latourrette, Gagny, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 10, 1979, Ser. No. 56,344
Claims priority, application France, Jul. 28, 1978, 78 22351
Int. Cl.² C09K *11/46*
U.S. Cl. 252—301.4 F **24 Claims**



1. A luminophor having the formula:

$$M_{5(1-\alpha)}Eu_{5\alpha}{}^{2+}SiO_4X_6$$

wherein M represents $Ba_{1-\beta}Sr_\beta$ or $Ba_{1-\beta}Ca_\beta$, with β being

greater than or equal to 0 and less than or equal to about 0.1; α is greater than 0 and less than or equal to about 0.2; and X represents $Cl_{1-\gamma}Br_\gamma$, with γ being greater than or equal to 0 and less than or equal to about 1 and wherein Eu^{2+} is present in amount sufficient to effect a narrow emission band spectrum that is essentially the same as curve A of FIG. 1.

4,220,552

METHOD OF PRODUCING DELAYED RELEASE OF SODIUM FLUORIDE

Charles J. Hitchcock, Cambridge, Mass., assignor to The United States of America as represented by the Department of Health, Education & Welfare, Washington, D.C.

Filed Jun. 5, 1978, Ser. No. 912,946

Int. Cl.² B01J *13/02;* B44D *1/02*

U.S. Cl. 252—316 **5 Claims**

1. A process of pretreating a lower alkyl cellulose to increase the aqueous release time of a later encapsulated sodium fluoride which comprises

(a) dispersing a predetermined quantity of lower alkyl cellulose in aqueous mineral acid, stirring, aqueous washing, and filtering to adjust the pH to about 6.0 or less and to obtain a product;

(b) dissolving the product of (a) in a BTX solvent, adding sodium fluoride and baffle stirring and drying to produce microencapsulation of said sodium fluoride with the lower alkyl cellulose product wherein the aqueous release time of the sodium fluoride is about 2.3–7.0 hours and the mesh size of particles if 40–60μm.

4,220,553

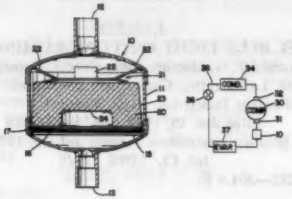
METHOD OF MAKING FILTER BLOCK OF AN ADSORBENT AND PHENOLIC-POLYURETHANE BINDER

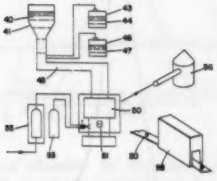
Walter O. Krause, Newark, N.Y., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Division of Ser. No. 864,560, Dec. 27, 1977, Pat. No. 4,144,171. This application Nov. 20, 1978, Ser. No. 962,532

Int. Cl.² B01J *31/06, 21/18, 21/04, 21/08*

U.S. Cl. 252—428 **4 Claims**





1. The method of producing a porous block for filtering and drying refrigerant fluids comprising the steps of:

(a) preparing a mixture of a solution of phenolic resin binder, a solution of polyurethane resin binder, and an activated adsorbent, the solution of phenolic binder and the solution of polyurethane binder each comprising of from 2.35% to 10% by weight of the mixture and the adsorbent comprising from 80% to 95.3% by weight of the mixture,

(b) molding the mixture into a block of predetermined shape,

(c) passing an alkaline gas through the block to cure the resins,

(d) passing air through the block to purge the alkaline gas therefrom, and

(e) finishing the block by heating the block to purge the same of the binder solvents whereby the finished block contains between 3% and 13.5% by weight of said binders combined.

4,220,554

COMPONENTS OF CATALYSTS FOR POLYMERIZING ALPHA-OLEFINS AND THE CATALYSTS FORMED FROM THE COMPONENTS

Umberto Scatà; Luciano Luciani, and Pier C. Barbe, all of Ferrara, Italy, assignors to Montedison S.p.A.,, Milan, Italy

Filed May 24, 1978, Ser. No. 909,047

Claims priority, application Italy, May 25, 1977, 23984 A/77; Jul. 4, 1977, 25344 A/77

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B **25 Claims**

1. Components of catalysts for the polymerization of olefins, obtained by reaction of a titanium halide with a carrier comprising a Mg compound having the formula $X_nMg(OR)_{2-n}$ in which $O \leqq n \leqq 2$, R is an alkyl, aryl or cycloalkyl radical containing from 1 to 20 carbon atoms, X is a halogen atom or a group OR' in which R', either the same or different from R, is an alkyl, aryl or cycloalkyl radical containing from 1 to 20 carbon atoms, said carrier being in the form of particles having a mean diameter ranging from 1 to 100μ, a surface area larger than 200 m^2/g and a porosity lower than 0.25 cc/g.

4,220,555

PREPARING POLYOLEFINS WITH A NARROW PARTICLE SIZE DISTRIBUTION AND CATALYST THEREFOR

Harry J. Wristers; Eugene E. Poirot, and Terrence Huff, all of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 837,431, Sep. 28, 1977, abandoned. This application Sep. 7, 1978, Ser. No. 938,661

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B **10 Claims**

1. A Ziegler type titanium halide catlayst composition for the polymerization of alpha-olefins having a narrow particle size distribution which comprises:

(a) from about 30 to about 80 Wt.% of catalytically active titanium halide catalyst particles;

(b) from about 1 to about 5 wt.% of a fibrillated polytetrafluoroethylene entrapping the catalyst particles; and

(c) from about 70 to about 20 Wt.% of a non-fibrillatable unsubstituted or halogen-substituted polyolefin stabilizing the catalyst against particle size degradation from ballmilling.

4,220,556

SILYLHYDROCARBYL PHOSPHINE TRANSITION METAL COMPLEXES

Alexis A. Oswald, Mountainside, and Lawrence L. Murrell, Elizabeth, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 829,590, Sep. 1, 1977, Pat. No. 4,151,114, which is a continuation-in-part of Ser. No. 610,628, Sep. 5, 1975, Pat. No. 4,083,803, which is a continuation-in-part of Ser. No. 265,507, Jun. 23, 1972, Pat. No. 3,907,852. This application Jan. 19, 1979, Ser. No. 4,801

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.² B01J *31/24*

U.S. Cl. 252—430 **14 Claims**

1. A method for heterogeneous transition metalphosphine complex catalysts preparation comprising the steps of:

(a) selectively adding silanes of the formula:

$$R_{4-y}SiH_y$$

wherein R is selected from the group consisting of chlorine, C_1–C_4 acyloxy and C_1–C_6 saturated aliphatic and aromatic hydrocarbyl provided that at least one substituent is chlorine or C_1–C_4 acyloxy and y is 1 or 2 to α- ω-dienes of the formula:

$$CH_2{=}CH[CH_2]_kCH{=}CH_2$$

wherein k ranges from 1 to 26, at temperatures between −90° and +90° C. using reactant ratios of 2 to 6 moles of diolefin per mole silane to form alkenyl silane adducts;

(b) adding phosphines of the formula:

$$R'_{3-x}PH_x$$

wherein R' is selected from the group consisting of C_1–C_{30} alkyl, cyclohexyl and phenyl and x is 1 to 3 to the alkenyl silane of the formula:

$$(R_{4-y}Si[(CH_2)_l CH{=}CH_2]_y)$$

of step (a) wherein R and y are as previously defined and l is k+2, at temperatures between −100° and +16° C. to form silylhydrocarbyl phosphines;

(c) complexing the silylhydrocarbyl phosphines of the formula:

$$(R'_{3-x}P)_Z[(CH_2)_m]_ySiR_{4-y}$$

of step (b) wherein R, R', x and y are as previously defined and Z is 1 or 2 and m is k+4, with transition metal compounds of the formula MX_n wherein M is a transition metal selected from the group consisting of Group VI, VII, and VIII of the Periodic Table of the Elements, X is an anion or organic ligand which satisfies the coordination sites of the metal and n is 2 to 6;

(d) anchoring the silylhydrocarbyl phosphine transition metal complexes of step (c) to inorganic solids selected from the group consisting of silica and metal oxides having hydroxyl groups to form covalent Si-O-anchoring bonds.

4,220,557
FLUORINE-PROMOTED SULFACTIVE METAL HYDROGENATION CATALYSTS

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Nov. 24, 1978, Ser. No. 963,573

Int. Cl.² B01J *27/12, 23/28, 23/30;* **C10G** *23/02*

U.S. Cl. 252—441 **10 Claims**

1. In the manufacture of an acidic, sulfactive hydrogenation catalyst wherein a first component of molybdenum and/or tungsten, a second component of nickel and/or cobalt, and a fluorine component are intimately composited with an alumina support, the improved method for incorporating said second component and said fluorine component into said catalyst in a single impregnation step, which comprises:

(1) forming porous cohesive aggregates comprising said alumina support in the form of calcined gamma alumina;

(2) compositing essentially all of said fluorine and said second component with said aggregates by impregnation, said impregnation consisting essentially of contacting said aggregates with an aqueous impregnation solution having dissolved therein one or more fluosilicate salts of cobalt and/or nickel, said solution containing fluorine essentially completely in the form of fluosilicate and containing essentially no fluorine in any other dissolved form, and said impregnation being carried out with an amount of impregnation solution sufficient to fill at least about 90% of the pore volume of said aggregates, but not substantially in excess of the amount required for 100% saturation thereof; and

(3) drying and calcining the impregnated aggregates from step (2)

4,220,558
ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 921,160, Jun. 30, 1978, Pat. No. 4,175,031, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Apr. 12, 1979, Ser. No. 29,507

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.² B01J *27/08, 27/10, 23/62, 23/64*

U.S. Cl. 252—441 **20 Claims**

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of an indium component.

4,220,559
HIGH TEMPERATURE-STABLE CATALYST COMPOSITION

Leon M. Polinski, North Plainfield, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Feb. 14, 1978, Ser. No. 877,775

Int. Cl.² B01J *29/06, 23/10, 23/16*

U.S. Cl. 252—455 R **10 Claims**

1. A catalyst composition consisting essentially of (a) a catalytically active calcined composite of alumina; a first metal oxide component selected from the group consisting of an oxide of a metal selected from the group consisting of strontium, barium, and lanthanum, and mixtures thereof; and a second metal oxide component selected from the group consisting of (i) an oxide of a metal selected from the group consisting of silicon, tin, and zirconium, and mixtures thereof, and (ii) an oxide of molybdenum, said composite having been formed by calcination of alumina in admixture with said metal oxide components at a temperature of at least 500° C. and being characterized by a surface area of at least 20 m^2/g when heated from four hours at 1200° C.; and (b) a material selected from the group consisting of precious metals, base metals or base metal oxides, and precious metals in combination with base metals or their oxides, incorporated in catalytically effective amount in said calcined composite.

6. The catalyst composition of claim 1 in which said calcined composite consists essentially of alumina, barium oxide or strontium oxide or a mixture thereof, and silica.

4,220,560
SPINEL DEHYDROGENATION CATALYST

Jean-Pierre Anquetil, de Grand Couronne, France; Michel Deflin, Houston, Tex.; Jean-Claude Clement, and Emmanuel E. A. Neel, both of de Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1978, Ser. No. 966,450

Claims priority, application France, Dec. 12, 1977, 77 37342

Int. Cl.² B01J *23/78, 23/80, 23/84, 23/86*

U.S. Cl. 252—468 **10 Claims**

1. A catalyst for the dehydrogenation of hydrocarbons to a more unsaturated hydrocarbon comprising:

(a) a spinel having the formula:

$$A_aCr_bFe_cO_4$$

wherein, A is selected from the group consisting of cobalt, zinc, manganese, magnesium or mixtures thereof, a is 1, b is

between 0 and 1, c is between 1 and 2 and the sum of a+b+c is 3,

(b) from about 0.1 to about 20 percent by weight of an alkali metal oxide, and

(c) from about 0.1 to about 10 percent by weight of a vanadium oxide.

4,220,561

OXATHIANE AND OXATHIOLANE DERIVATIVES AS PERFUMING AGENTS

Max Winter, deceased, late of Vandoeuvres, Switzerland, and by Pierre Mottu, executor, Geneva, Switzerland, assignors to Firmenich SA, Geneva, Switzerland

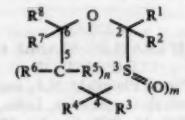
Continuation-in-part of Ser. No. 600,275, Jul. 31, 1975, abandoned. This application Jun. 10, 1977, Ser. No. 805,338

Claims priority, application Switzerland, Aug. 2, 1974, 10619/74; Jan. 16, 1975, 520/75

Int. Cl.[2] C11B *9/00;* **C07D** *327/04, 327/06*

U.S. Cl. 252—522 R **23 Claims**

4. Method for improving or enhancing the odoriferous properties of perfumes which comprises adding thereto a small but odoriferously effective amount of at least one compound of formula (I):



in which:

(a) n stands for 1 and m represents zero or 1, and each of symbols R^1 to R^8 represents a hydrogen atom or a saturated or unsaturated, linear or branched alkyl radical containing from 1 to 11 carbon atoms, or

(b) n stands for 1 and m represents zero or 1, each of symbols R^1, R^2, R^3 and R^4 have the above-described meaning, R^5 and R^7 each represents hydrogen and R^6 together with R^8 and the carbon atoms carrying them, in positions 5 and 6 respectively, form a lower alkyl substituted or unsubstituted cyclopentane or cyclohexane ring, or

(c) n stands for 1 and m represents zero or 1, each of symbols R^1, R^3, R^5, R^6 and R^7 represents hydrogen, R^2 represents a lower alkyl radical or a hydrogen atom, R^4 represents a para-lower alkyl or lower alkoxy substituted or unsubstituted phenyl or a lower alkyl substituted or unsubstituted cyclohexenyl radical, and R^8 stands for a lower alkyl, or

(d) n stands for 1 and m represents zero or 1, each of symbols R^1, R^3, R^5, R^6 and R^7 represents hydrogen, R^2 a para-lower alkyl or lower alkoxy substituted or unsubstituted phenyl or a lower alkyl substituted or unsubstituted cyclohexenyl radical, R^4 represents a lower alkyl radical or a hydrogen atom, and R^8 stands for a lower alkyl or a hydrogen atom.

4,220,562

LAUNDRY ADDITIVE PRODUCT

Gianfranco L. Spadini, Newcastle upon Tyne; Ian D. Tolliday, Oakham, and Allan C. McRitchie, Blyth, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 26, 1978, Ser. No. 919,531

Claims priority, application United Kingdom, Jun. 29, 1977, 27273/77; Mar. 6, 1978, 8777/78; Mar. 7, 1978, 8988/78

Int. Cl.[2] C11D *1/62, 7/32, 17/00*

U.S. Cl. 252—542 **22 Claims**

1. A laundry additive product adapted for the removal of stains and consisting essentially of

(a) a substrate comprising a non-particulate solid article in the form of a sheet, block, ring, ball, rod or tube, said article possessing sufficient structural integrity under wash conditions to be recovered substantially intact at the end of the laundry cycle, in water releasable combination with,

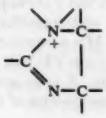
(b) an organic peroxy compound precursor selected from the group consisting of imides, acyl hydrazides, acylated oximes, anhydrides, and esters wherein the weight ratio of the precursor to the substrate lies in the range from 30:1 to 1:10, and

(c) a surfactant system comprising an alkoxylated nonionic surfactant having an HLB in the range 8.0–17.0 and a cationic surfactant having the empirical formula:

$R_m{}^1R_x{}^2Y_LZ$

wherein R^1 is a hydrophobic organic group containing alkyl chains optionally including aryl groups and which may also contain ether linkages, ester linkages, or amide linkages, and containing a total of from 8 to 20 carbon atoms, m is a number from one to three, and no more than one R^1 can have more than 16 carbon atoms when m is 2 or more than 12 carbon atoms when m is 3, R^2 is a substituted or unsubstituted alkyl group containing from one to four carbon atoms or a benzyl group, provided that not more than one such benzyl group is directly attached to each Y group, x is a number from zero to three, the remainder of any carbon atom positions being filled by hydrogens, Y is selected from the group consisting of

(1)

(2) 

(3)

(4)

L is a number from 1 to 4, Z is a water-soluble anion in a number to give electrical neutrality, the cationic surfactant being water dispersible in admixture with the nonionic surfactant, the weight ratio of the nonionic surfactant to the cationic surfactant being in the range 20:1 to 1:2, the weight ratio of the surfactant system to the substrate being in the range 20:1 to 1:5.

4,220,563

HEAT-CURABLE AND SOLVENT-SOLUBLE ESTER GROUP-CONTAINING POLYMER COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Shigeyoshi Hara, and Takeyoshi Yamada, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 593,644, Jul. 7, 1975, Pat. No. 4,137,221. This application Nov. 1, 1977, Ser. No. 847,580

Claims priority, application Japan, Jul. 11, 1974, 49-78672

Int. Cl.[2] C08L *67/02*

U.S. Cl. 260—2.3 **14 Claims**

1. A process for producing a heat-curable and solvent-soluble ester group-containing polymer composition which comprises

(1) reacting a highly polymerized linear aromatic polyester having an intrinsic viscosity (η), measured on an o-chlorophenol solvent at 35° C., of above 0.3 (component 1) with

10 to 70 mole%, based on the total amount, in moles, of dibasic acid contained in the polyester, of a diaryl carbonate (component 2) to depolymerize the polyester and form a solvent-soluble low molecular weight polyester (component A) in which at least 30 mole% of the entire terminal groups are aryl carboxylate groups, and

(2) (i) mixing or (ii) partially reacting component A with a polymeric polyfunctional compound (component B) containing at least two reactive groups selected from the group consisting of a hydroxyl group, a primary amino group and a secondary amino group.

4,220,564

HIGH-HARDNESS AND HIGH-MODULUS RUBBER COMPOSITION CONTAINING 1,2-POLYBUTADIENE

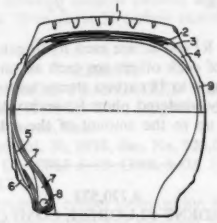
Tsutomu Tanimoto; Mutsuo Nagasawa, both of Yokkaichi, and Junji Kashiwakura, Asahimachi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1979, Ser. No. 1,274

Claims priority, application Japan, Jan. 9, 1978, 53-973; Sep. 25, 1978, 53-117657

Int. Cl.² C08L 7/00, 9/06

U.S. Cl. 260—5 **14 Claims**



1. A high-hardness and high-modulus rubber composition, comprising: 15 to 50 parts by weight of 1,2-polybutadiene having a 1,2-addition unit content of at least 70%, a crystallinity of 5 to 40% and an intrinsic viscosity [η] of at least 0.7 dl/g as measured in toluene at 30° C., 85 to 50 parts by weight of at least one rubber selected from the group consisting of natural rubber and diene-based rubbers, and 3 to 10 parts by weight of sulfur per 100 parts by weight of the rubber ingredients.

4,220,565

IMMUNOCHEMICAL CONJUGATES: METHOD AND COMPOSITION

David H. Katz, La Jolla, Calif., assignor to Scripps Clinic & Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 764,586, Feb. 2, 1977. This application Jan. 18, 1979, Ser. No. 4,333

Int. Cl.² C08L 77/04, 89/00

U.S. Cl. 260—6 **4 Claims**

1. An improved method of preparing immunosuppressive conjugates of D-glutamic acid-D-lysine copolymer and an antigen, comprising the steps of:

(a) reacting D-glutamic acid-D-lysine copolymer with either m-maleimidobenzoyl-N-hydroxysuccinimide ester to form MB-D-GL or with S-acetylmercaptosuccinic anhydride to form SH-D-GL;

(b) reacting antigen with either m-maleimidobenzoyl-N-hydroxysuccinimide ester to form MB-Antigen or with S-acetylmercaptosuccinic anhydride to form SH-Antigen;

(c) reacting MB-D-GL with SH-Antigen or reacting SH-D-GL with MB-Antigen to form said conjugates of D-glutamic acid-D-lysine copolymer with antigen.

4,220,566

AQUEOUS BASED SLURRY CONTAINING ENEDIOL BREAKER AND METHOD FOR FORMING A CONSOLIDATED GRAVEL PACK

Vernon G. Constien, Owasso, and Peter E. Clark, Tulsa, both of Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1978, Ser. No. 888,811

Int. Cl.² C08L 1/28; E21B 33/13, 43/02

U.S. Cl. 260—13 **12 Claims**

1. In a slurry suitable for use in emplacing a permeably consolidated particulate mass in communication with a permeable subterranean formation, of the type containing an epoxy resin-solvent mixture, a curing agent for the epoxy resin, a particulate material, a coupling agent, a quaternary ammonium halide surfactant, an aqueous carrier fluid containing a viscosity builder, and a breaker to reduce the viscosity of said carrier fluid after a period of time, the improvement which comprises: as the breaker, a compound having an aromatic or α-carbonyl enediol functional group.

4,220,567

STABILIZING PIGMENTED LACQUERS WITH ZEOLITES

Friedrich Kindervater; Günter Ulisch; Theodor Bohmann, all of Leverkusen; Manfred Mengel, Cologne, and Lothar Puppe, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Atkiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,010

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726888

Int. Cl.² C09D 1/02, 3/64

U.S. Cl. 260—22 A **6 Claims**

1. A lacquer comprising a saturated polyester, at least one pigment or filler, and a crystalline zeolite in an amount sufficient to increase the dispersibility of the pigment or filler, the zeolite having an average particle size of about 0.5 to 5 μm.

4,220,568

POLYESTER CONTAINING CARBOXYL GROUPS, A PROCESS FOR PRODUCING THIS POLYESTER AND AQUEOUS COATING COMPOSITIONS CONTAINING THIS POLYESTER

Hans-Peter Patzschke, Wuppertal, Fed. Rep. of Germany, assignor to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Fed. Rep. of Germany

Division of Ser. No. 912,058, Jun. 2, 1978. This application Apr. 13, 1979, Ser. No. 29,956

Claims priority, application Austria, Jun. 6, 1977, 3983/77

Int. Cl.² C08L 91/00, 67/02

U.S. Cl. 260—22 D **42 Claims**

1. A carboxyl-group-containing polyester resin having an acid number of from 30 to 150, a hydroxyl number of from 20 to 150 and a Patton alkyd constant of from 0.9 to 1.2 which contains to co-condensed form:

(a) Saturated alcohols selected from the group consisting of dihydric aliphatic, polyhydric aliphatic dihydric, cycloaliphatic and polyhydric cycloaliphatic alcohols,

(b) dicarboxylic acids selected from the group consisting of aliphatic, aromatic and cycloaliphatic dicarboxylic acids,

(c) cyclic carboxylic acids selected from the group consisting of tribasic and polybasic cyclic carboxylic acids, characterised in that of the co-condensed compounds (c), which are only attached to the polyester through a carboxyl group, at least one other carboxyl group is condensed with compound selected from the group consisting of aliphatic monoalcohols having from 3 to 20 carbon atoms, cycloaliphatic monoalcohols containing from 3 to 20 carbon atoms and secondary amines containing from 6 to 36 carbon atoms.

8. A polyester according to claim 1, characterised in that, the co-condensed compounds (b) are selected from the group

consisting of aliphatic saturated dicarboxylic acids and dimerised unsaturated fatty acids and are present in a quantity of up to 20mole % based on the total sum of the molar numbers of all the carboxylic acids present.

4,220,569

ACRYLATED EPOXIDIZED SOYBEAN OIL URETHANE COMPOSITIONS AND METHOD

George W. Borden, Charleston; Oliver W. Smith, South Charleston, and David J. Trecker, Charleston, all of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

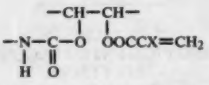
Division of Ser. No. 103,912, Jan. 4, 1971, abandoned. This application Mar. 22, 1973, Ser. No. 343,694

Int. Cl.[2] C09D *3/72, 11/10*

U.S. Cl. 260—23 EP **32 Claims**

1. A composition comprising:

I an acrylated epoxidized soybean oil urethane compounds having in the molecule the group:



wherein X is hydrogen or methyl, said compounds being the reaction product of:

(A) epoxidized soybean oil reacted with acrylic acid or methacrylic acid and

(B) an organic isocyanate, and

II a photosensitizer.

4,220,570

STABILIZER COMBINATION FOR VINYL CHLORIDE POLYMERS CONTAINING PARTIAL ESTERS OF PENTAERYTHRITOL WITH FATTY ACIDS

Frido Löffelholz, Bremerhaven; Peter Wedl, Loxstedt-Bexhövede, and Kurt Worschech, Loxstedt, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KgaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,515

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642509

Int. Cl.[2] C08K *5/09, 5/10, 5/13*

U.S. Cl. 260—23 XA **11 Claims**

1. A stabilizer combination for molding compositions based on polyvinyl chloride, and/or mixed polymers containing predominantly vinyl chloride which consists essentially of

(a) per 100 parts by weight of partial ester of pentaerythritol with a fatty acid of 12 to 22 carbon atoms, having an OH number between 140 and 580 and an acid number below 15,

(b) 200 to 350 parts by weight of an alkaline earth metal soap selected from the group consisting of calcium stearate, zinc stearate, calcium palmitate, zinc palmitate and any mixture of said alkaline earth metal soaps,

(c) 200 to 300 parts by weight of a lubricant selected from the group consisting of

(1) a waxy hydrocarbon selected from the group consisting of paraffin having a solidification point between 50° C. and 110° C. and low molecular weight polyethylene having a softening point of below 140° C.,

(2) a fatty acid with 12 to 22 carbon atoms, and

(3) a mixture of said waxy hydrocarbon and said fatty acid with 12 to 22 carbon atoms, and

(d) 5 to 20 parts by weight of an antioxidant.

4. A moldable composition consisting essentially of from 90% to 99.5% by weight of a thermoplastic resin selected from the group consisting of polyvinyl chloride, a mixed polymer containing mainly vinyl chloride, and any mixture thereof, and from 0.5 to 10% by weight of the stabilizer combination of claim 1.

4,220,571

THERMOPLASTIC POLYOLEFIN COMPOSITION AND PROCESS FOR STABILIZING POLYOLEFINS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.J.

Continuation of Ser. No. 767,935, Feb. 11, 1977, abandoned. This application Oct. 11, 1978, Ser. No. 950,522

Claims priority, application Sweden, Feb. 19, 1976, 2032/76

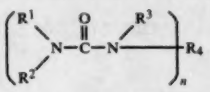
Int. Cl.[2] C08K *5/21*

U.S. Cl. 260—45.9 NC **8 Claims**

1. A polyolefin molding composition which is stabilised against thermooxidative degradation with a substituted urea derivative, which composition contains

(a) an aliphatic polyolefin which is derived from one or more hydrocarbon monoolefins,

(b) 0.005 to 5% by weight of said polyolefin of a substituted urea of the formula I



(I)

in which n is 1, R^1 and R^3 are each hydrogen, and R^2 and R^4, independently of each other, are each an unsubstituted alkyl group containing 4 to 18 carbon atoms, and

(c) a sterically hindered phenolic antioxidant in a positive amount of up to the amount of the substituted urea of formula I.

4,220,572

POLYVINYLIDENE FLUORIDE COMPOSITIONS OF IMPROVED THERMAL STABILITY

Wolfgang Rohlfing, Troisdorf, and Peter Vanheiden, Bornheim-Hersel, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Atkiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 911,011

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1977, 2724612

Int. Cl.[2] C08K *3/32, 5/51, 5/53*

U.S. Cl. 260—45.95 L **14 Claims**

1. A stabilized vinylidene fluoride polymer containing composition consisting essentially of a vinylidene fluoride homo- or copolymer and a stabilizing amount of a phosphinate said phosphinate being a C_1–C_8 alkyl ester of phosphinic acid or an alkaline earth metal salt of phosphinic acid.

4,220,573

NOVEL IONIC POLYMER COMPOSITIONS

Jan Bock, Houston, Tex.; Neville G. Thame, Montclair, N.J., and Lowell Westerman, Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 855,549, Nov. 29, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,787

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23.5 A **8 Claims**

1. A polymeric composition, which consists essentially of a homogeneous blend of:

(a) an ionic polymer having about 10 to about 50 meq. of pendent metal neutralized sulfonate groups affixed to an elastomeric polymeric backbone, said sulfonate groups being neutralized with an ammonium or metal cation selected from the group consisting of Groups IA, IIA, IB and IIB, iron, antimony and lead of the Periodic Table of Elements, said elastomeric backbone being selected from the group consisting of Butyl rubber and EPDM terpolymers; and

(b) a preferential plasticizer at a concentration level of about 7 to about 50 parts by weight per 100 parts by weight of said ionic polymer, said preferential plasticizer being a mixture of a fatty acid and at least one metallic salt of said fatty same acid, said mixture consisting of at least 25 wt. % of at least one said metallic salt of said fatty acid, said metallic salts having different metallic cations, and said fatty acid having about 10 to about 30 carbon atoms.

3. A polymeric composition which consists essentially of a homogeneous blend of:

(a) an ionic polymer having about 10 to about 50 meq. of metal neutralized sulfonate groups affixed to a plastic polymeric backbone, said plastic polymeric backbone being selected from the group consisting of polystyrene, polyethylene and polypropylene, said metal neutralized sulfonate groups containing a metal counterion selected from the group consisting of Groups IA, IIA, IB and IIB and iron, antimony, and lead of the Periodic Table of Elements; and

(b) a preferential plasticizer at a concentration level of about 7 to about 50 parts by weight per 100 parts by weight of said ionic polymer, said preferential plasticizer being a mixture of a fatty acid and at least one metallic salt of same fatty acid, said mixture consisting of at least 25 wt. % of at least one said metallic salt of said fatty acid, said metallic salts having different metallic cations, and said fatty acid having about 10 to about 30 carbon atoms.

4,220,574

POLYCHLOROPRENE PLASTICIZED WITH CORN OIL

Rosario J. Perrone, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 923,017
Int. Cl.[2] C08J *3/18;* C08K *5/01, 5/11*
U.S. Cl. 260—23.7 H **3 Claims**

1. A polychloroprene rubber composition having excellent resistance to heat and ozone and excellent low temperature properties comprising polychloroprene as the sole polymer and from 15 to 50 parts by weight of corn oil per 100 parts of polychloroprene.

4,220,575

AQUEOUS LOW GLOSS PIGMENTED COATING COMPOSITIONS CONTAINING CAPROLACTONE-POLYOL ADDUCTS

David R. Wallace, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 6, 1978, Ser. No. 940,044
Int. Cl.[2] C08L *61/10, 61/28*
U.S. Cl. 260—29.3 **15 Claims**

1. An aqueous coating composition useful for imparting to metal coil a low gloss pigmented protective finish having good metal marking resistance, said composition consisting essentially of:

(a) from about 10 percent to about 50 percent of a water-insoluble film-forming acrylic resin, vinyl resin or mixture thereof;

(b) from about 0.5 percent to about 7 percent of flatting agent, said agent being water-insoluble agglomerated particulate beads having a gross particle diameter of from about 1 micron to about 60 microns, wherein said beads consist essentially of the reaction product of urea, melamine or phenol and formaldehyde having a molar ratio of the urea to the formaldehyde of from about 1:1 to about 6:1, a molar ratio of the melamine to the formaldehyde of from about 1:1 to about 1:4, and a molar ratio of the phenol to the formaldehyde of from about 1:1 to about 1:3;

(c) from about 0.5 percent to about 7 percent of a caprolactone-polyol adduct having a weight average molecular weight of from about 250 to about 2500;

(d) from about 5 percent to about 40 percent of pigment; and

(e) the balance water.

4,220,576

PRODUCTS BASED ON PLASTER AND PROCESSES FOR THEIR MANUFACTURE

Francois Tatard, Rennes, France, assignor to Societe d'Investissement pour le Developpement des Appareils Menagers, Montrouge, France

Filed Jul. 25, 1978, Ser. No. 927,936
Claims priority, application France, Jul. 26, 1977, 77 22934
Int. Cl.[2] C08L *61/28*
U.S. Cl. 260—29.4 R **11 Claims**

1. A method of manufacture of a calcium sulfate-based product comprising: admixing water, a resin selected from the group consisting of urea-formol resin and melamine-formol resin, and a calcium sulfate powder to form a paste, said powder comprising gypsum and plaster, said gypsum constituting a major portion of said calcium sulfate powder, the amount of said resin being from 1 to 5% based on the weight of said powder; shaping the paste under slight pressure; and heating the shaped material at a temperature of from 105° to 120° C.

4,220,577

IODOPROPARGYL PYRIDYL AND PICOLINYL ETHERS AND THIOETHERS AS PAINT FUNGICIDES

Harold A. Brandman, Glen Ridge; Joachim E. Freudewald, Morristown; Milton Manowitz, Fair Lawn; Edward J. Nikawitz, Glen Rock, and Frederick H. Sharpell, Jr., Pequannock, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 898,759, Apr. 20, 1978, Pat. No. 4,170,704.
This application Apr. 20, 1979, Ser. No. 31,814
Int. Cl.[2] C08K *5/34*
U.S. Cl. 260—29.6 MN **14 Claims**

1. A method for protecting finished latex paint films from fungal attack which comprises incorporating into the paint an effective amount of a compound of the formula:

$$R—O—CH_2—C{\equiv}CI$$

wherein R is a 3-pyridyl radical.

4,220,578

METHOD, RESIN AND CATALYST FOR INCREASING THE TENSILE STRENGTH AND CORE HARDNESS OF A SAND MOLD OR CORE

Khe-Bing J. Kho, and Patrick H. Stewart, both of Danville, Ill., assignors to CL Industries Inc., Danville, Ill.

Division of Ser. No. 809,546, Jun. 23, 1977. This application Mar. 27, 1978, Ser. No. 890,683
Int. Cl.[2] C08K *5/11*
U.S. Cl. 260—31.8 M **10 Claims**

1. A method for increasing the tensile strength and core hardness of a sand mold or core, said mold or core being formed by acid polymerizing a mixture of a thermosetting acid-hardenable resin and sand, which comprises, prior to polymerization, adding to and uniformly blending in said mixture an amount, from 0.5 to 30% by weight of resin sufficient to increase the tensile strength or core hardness of the polymerized mixture, of a dialkyl ester of the formula:

$$R_1OOC(CH_2)_nCOOR_2$$

wherein R_1 and R_2, which may be the same or different, are selected from alkyl of 1 to 20 carbon atoms and n is 2, 3 or 4.

4,220,579

THERMOPLASTIC ELASTOMERIC BLEND OF MONOOLEFIN COPOLYMER RUBBER, AMORPHOUS POLYPROPYLENE RESIN AND CRYSTALLINE POLYOLEFIN RESIN

Robert E. Rinehart, Newtown, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Apr. 17, 1978, Ser. No. 897,066
Int. Cl.[2] C08L 23/16
U.S. Cl. 260—33.6 AQ 9 Claims

1. A thermoplastic elastomer which is a blend of:

A. a monoolefin copolymer rubber which is a copolymer of ethylene and an alpha-monoolefin of the formula CH_2=CHR where R is an alkyl radical having 1 to 12 carbon atoms, and a copolymerizable non-conjugated diene termonomer, said rubber having a Brookfield viscosity in excess of 5,000,000 cps at 375° F.;

B. an amorphous non-elastomeric polypropylene resin having a number average molecular weight of from 500 to 35,000 or amorphous non-elastomeric resinous copolymer of propylene with another monoolefin having a Brookfield viscosity less than 500,000 cps at 375° F., said amorphous non-elastomeric resin being soluble below 100° C. in aliphatic, aromatic and halogenated hydrocarbon solvents; and

C. a crystalline polyolefin plastic insoluble in the aforesaid solvents below 100° C.;

the said ingredients A, B and C being present in the following proportions, expressed as percent by weight based on the sum of the weights of A, B and C:

from 15 to 80% of A,
from 5 to 45% of B, and
from 15 to 80% of C,

the said thermoplastic elastomer being in a dynamically partially cured state.

4,220,580

BINGHAM FLUID COMPOSITIONS

Robert J. Rowatt, Orange, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jul. 24, 1978, Ser. No. 927,229
Int. Cl.[2] C08F 4/58
U.S. Cl. 260—33.6 PQ 21 Claims

1. A polymerization-initiating, polymerization-controlling or polymerization-modifying Bingham fluid composition suitable for continuous direct addition to a continuous olefin polymerization reaction system, said composition being a solid at ambient temperature and capable of flow under an applied pressure, said composition consisting essentially of:

(a) a continuous solid phase consisting essentially of an intimate mixture of:

(i) 100 parts by weight of a liquid hydrocarbon,

(ii) 2 to 250 parts by weight of a finely-divided olefin polymer, and

(iii) a minor amount of at least 0.2 part by weight of a finely-divided siliceous material having at least one dimension smaller than about 0.01 micron, said siliceous material having a number of hydroxyl groups attached to silicon atoms and having an oxygen/silicon ratio of at least about 2.1/1.0, and

(b) at least one functional material uniformly dispersed throughout the continuous solid phase of (a); said functional material being a polymerization initiator or a telogenating agent.

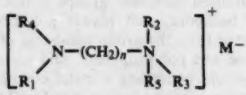
4,220,581

CASTOR BASED QUATERNARIES

Murray C. Cooperman, East Windsor; Francis Duneczky, Westfield; Francis C. Naughton, Mountainside, and Robert W. White, Califon, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,098
Int. Cl.[2] C08H 3/00; C09F 5/00; A61K 7/06; D06B 3/00
U.S. Cl. 260—402.5 9 Claims

1. A quaternary compound of the formula:



wherein: R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkyl of about 1 to 10 carbon atoms and alkenyl of up to about 10 carbon atoms; n is an integer of about 1 to 10; R_4 is selected from the group consisting of 12-hydroxystearyl; ricinoleyl, 12-(2-hydroxyethyloxy)-stearyl, 12-(2-hydroxyethyloxy) oleyl, 12-(2-hydroxypropyloxy) stearyl and 12-(2-hydroxy propyloxy) oleyl; R_5 is selected from the group consisting of benzyl and alkyl of about 1 to 3 carbon atoms; and M is selected from the group consisting of chloride, bromide, phosphate and sulfate.

4,220,582

DENTAL RESTORATIVE COMPOSITIONS OF IMPROVED X-RAY OPACITY

Jan A. Orlowski, Altadena; Patrick D. Kidd, Sierra Madre, and David V. Butler, West Covina, all of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 804,291, Jun. 7, 1977, abandoned. This application Jan. 3, 1979, Ser. No. 667
Int. Cl.[2] C08K 3/22, 3/36, 3/40
U.S. Cl. 260—42.28 4 Claims

1. A dental restorative composition having a filler and a liquid resin binder, that is substantially opaque to dental diagnostic X-rays, and that is formed from ingredients that facilitate matching the infractive index of the binder with that of the filler, consisting essentially of:

from 70% to 85% by weight of the composition of a mixture of finely divided inorganic filler materials;

from 15% to 30% by weight of the composition of a liquid resin dimethacrylate binder; and

a curing system for the liquid resin binder that will cause curing of the composition, upon admixture of the ingredients, in less than about ten minutes;

said filler mixture consisting essentially of a transparent barium glass admixed with a different inorganic particulate filler material, that comprises amorphous silica, the barium glass providing about 60% by weight of the mixture and the balance of the mixture being an amount of a different, inorganic particulate filler material;

said barium glass being formed from a mixture of BaO, $B_2O_3Al_2O_3$, and SiO_2, said glass being essentially free of monovalent elements and having a BaO content of at least 22.5% by weight thereof and that is substantially equal in molar percentage to the sum of the molar percentages of Al_2O_3 and B_2O_3 respectively;

the filler content of the composition, and the BaO content of the filler, being such that the BaO content of the composition is in the range from about 15% to about 28% by weight of the composition.

4,220,583

TRANSLUCENT, FLAME-RETARDANT POLYCARBONATE COMPOSITIONS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 6, 1978, Ser. No. 967,088
Int. Cl.[2] C08K *3/30;* C08L *57/08, 69/00*
U.S. Cl. 260—45.7 S 10 Claims

1. A thermally stable, translucent and flame retardant polycarbonate composition consisting essentially of an admixture of an aromatic polycarbonate, a minor amount of a partially fluorinated polyolefin selected from the group consisting of poly(vinylidene fluoride), poly(vinyl fluoride), poly(trifluoroethylene), poly(chlorotrifluoroethylene) and poly(trifluoroethylene alkali metal sulfonate) or mixtures of said partially fluorinated polyolefin with poly(tetrafluoroethylene) and poly(hexafluoropropylene) and a minor amount of a flame retardant salt selected from the group consisting of an organic alkali metal salt or an organic alkaline earth metal salt or mixtures thereof.

4,220,584

E. COLI ENTEROTOXIN VACCINE FOR VETERINARY AND HUMAN USE

Guadalupe A. Limjuco, Scotch Plains; Yashwant D. Karkhanis, Fanwood, and Dennis J. Carlo, South Amboy, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 30, 1978, Ser. No. 873,181
Int. Cl.[2] A61K *37/02, 39/02*
U.S. Cl. 260—112 R 2 Claims

1. A heat-labile enterotoxin vaccine for immunization against *E. Coli* caused diarrhea which is isolated from *E. Coli* culture filtrate having a molecular weight of 10,000–13,000 when determined by gel filtration or by sucrose density gradient; containing 90% protein, 2% hexose, no 2-keto deoxy octonic acid; being a homogeneous single chain protein with N-terminal alanine when determined by the dansylation method and SDS-acrylamide electrophoresis; and showing no activity in the limulus lysate assay.

4,220,585

DRILLING FLUID ADDITIVES

Paul H. Javora, and Bethel Q. Green, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 903,281, May 5, 1978, abandoned. This application Apr. 4, 1979, Ser. No. 27,189
Int. Cl.[2] C07G *1/00;* C09K *7/00*
U.S. Cl. 260—124 R 12 Claims

1. An additive for drilling fluids effective for dispersing clay in an aqueous medium consisting essentially of water-soluble lignosulfonate salt having a cation selected from the group consisting of zirconium, titanium, zirconium-iron mixture and titanium-iron mixture.

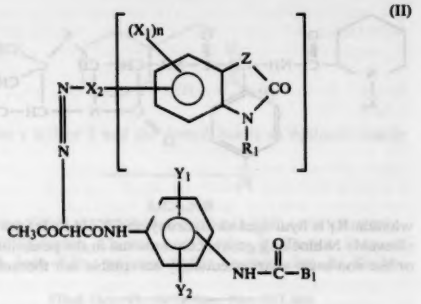
4,220,586

HETERO-ARYL AZO ACYLAMINO SUBSTITUTED ACETO-ACETARYLIDE PIGMENTS

Georg Cseh, Arlesheim; Armand Roueche, Bottmingen, and Stefan Hari, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,949
Claims priority, application Switzerland, Nov. 9, 1976, 14095/76
Int. Cl.[2] C09B *29/32;* C09D *3/00, 11/02, 11/16*
U.S. Cl. 260—157 5 Claims

1. A monoazo pigment of the formula



(II)

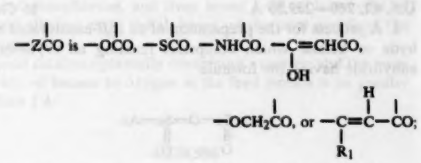
wherein

R_1 is hydrogen; alkyl of 1–4 carbon atoms; or phenyl which is unsubstituted or substituted by halo, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms;

X_1 is hydrogen, halo, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms or phenoxy;

n is 1 or 2;

X_2 is a direct bond or phenylene;



Y_1 is hydrogen, halo, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms or acetylamino;

Y_2 is hydrogen, halo, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms;

B_1 is hydrogen; alkyl of 1–4 carbon atoms; alkoxy of 1–4 carbon atoms; phenyl which is unsubstituted or substituted by halo, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms; phenoxy; or a group of the formula —NHQ wherein Q is hydrogen, alkyl of 1–6 carbon atoms, or phenyl which is unsubstituted or substituted by halo, alkyl of 1–4 carbon atoms or alkoxy of 1–4 carbon atoms.

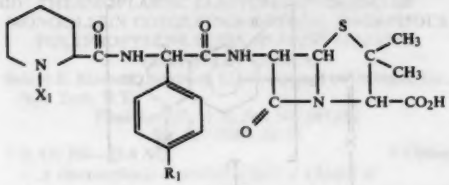
4,220,587

AMINO ACID DERIVATIVES OF 6-(2-AMINO-2-ARYLACETAMIDO)PENICILLANIC ACIDS

Yoshiharu Morita; Kenzo Omata, both of Yokohama; Junichi Ohya, Zama; Kazuo Wagatsuma, Yokohama, and Tadashi Shirasaka, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Division of Ser. No. 713,808, Aug. 12, 1976, Pat. No. 4,111,932. This application Jun. 14, 1978, Ser. No. 915,481
Claims priority, application Japan, Sep. 8, 1975, 50/108708; Sep. 8, 1975, 50/108709; Feb. 6, 1976, 51/12119; Feb. 6, 1976, 51/12121; Feb. 14, 1976, 51/15335; Feb. 16, 1976, 51/15563
The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.
Int. Cl.[2] C07D *499/70*
U.S. Cl. 260—239.1 3 Claims

1. A compound having the formula:



wherein R_1 is hydrogen or hydroxy and X_1 is hydrogen or a cleavable N-blocking group, conventional in the penicillin art, or the non-toxic pharmaceutically acceptable salt thereof.

4,220,588

CHEMICAL PROCESSES

Derek H. R. Barton; David J. Lester, both of Institute de Chimie des Substances Naturelles, 91190 Gif sur Yvette, France, and Steven V. Ley, Imperial College, London, England (SW7 2AY)

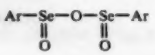
Filed Jan. 31, 1979, Ser. No. 8,074

Claims priority, application United Kingdom, May 31, 1978, 26114/78

Int. Cl.² C07J *9/00*

U.S. Cl. 260—239.55 A **16 Claims**

1. A process for the preparation of an α,β-unsaturated aldehyde or ketone which comprises reacting an arylseleninic anhydride having the formula



in which Ar represents an unsubstituted phenyl or nitrophenyl with a cycloaliphatic aldehyde or ketone having at least one hydrogen atom in the α-position which is or can be in the synconfiguration with respect to at least one hydrogen atom in the said β-position.

4,220,589

N-(OXAZOLIDINOTHIO) IMIDES THAT PROVIDE SCORCH RETARDANT NONBLOOMING ELASTOMERIC COMPOSITIONS

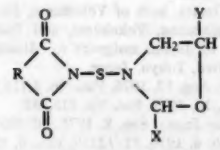
Ivan C. Popoff, Upper Dublin Township, Montgomery County; Everett A. Mailey, Plymouth Township, Montgomery County, and Paul G. Haines, Lafayette Hill, all of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 23, 1978, Ser. No. 909,596

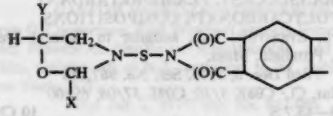
Int. Cl.² C07D *263/32*

U.S. Cl. 548—215 **7 Claims**

1. A N-(oxazolidinothio)imide compound having the structural formula:



wherein R is an organic divalent radical selected from the group consisting of ortho-phenylene, 1,2-cyclohex-4-enediyl, 1,2-cyclohexanediyl, 4-methyl-1,2-cyclohexanediyl, 1,2-ethanediyl, and 1,2-ethenediyl; furthermore R can be the divalent radical:



X is a monovalent organic radical selected from the group consisting of phenyl and trichloromethyl radicals; Y is hydrogen with the proviso that Y can be phenyl when X is trichloromethyl.

4,220,590

ASYMMETRIC CATALYSIS

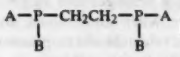
William S. Knowles, St. Louis; Milton J. Sabacky, Ballwin, and Billy D. Vineyard, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 724,049, Sep. 16, 1976, Pat. No. 4,142,992, which is a division of Ser. No. 514,987, Oct. 15, 1974, Pat. No. 4,008,281, which is a continuation-in-part of Ser. No. 421,463, Dec. 3, 1973, abandoned. This application Jul. 31, 1978, Ser. No. 929,635

Int. Cl.² C07C *101/02, 103/50;* C07D *209/20, 233/64*

U.S. Cl. 260—326.14 T **46 Claims**

1. In a process for catalytically asymmetrically hydrogenating a β-substituted-α-acylamido-acrylic acid and/or its salts, esters or amides in the presence of a homogeneous, optically active catalyst having an optically active phosphine ligand in order to afford a desired optical enantiomorph in at least about 89.4% optical purity, the improvement wherein the catalyst is a coordinated complex catalyst comprising a transition metal selected from the group consisting of rhodium, iridium and ruthenium in combination with from about 0.5 to about 2.0 moles per mole of metal of an optically active bis phosphine ligand represented by the structural formula



wherein A and B each independently represent substituted and unsubstituted alkyl of from 1 to 12 carbon atoms, substituted and unsubstituted cycloalkyl having from 4 to 7 carbon atoms or substituted and unsubstituted aryl; provided that such substituents provide no significant interference with the steric requirements around the phosphorus atom and A and B are different.

4,220,591

INSECTICIDAL ESTERS

George Holan, Brighton, and Reimund A. Walser, Box Hill, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

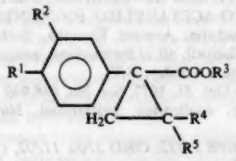
Filed Nov. 17, 1976, Ser. No. 742,575

Claims priority, application Australia, Nov. 26, 1975, PC4078

Int. Cl.² C07C *69/76*

U.S. Cl. 260—340.5 R **20 Claims**

1. The (+), (−), and (±) forms of the compounds of the general formula I



I

wherein R′ is hydrogen or a methoxy, ethoxy, propoxy, meth-

ylthio, ethylthio, propylthio, fluoro, chloro, bromo, methyl, ethyl, nitro or amino group, and R^2 is hydrogen or methyl or R^1 and R^2 together form a methylenedioxy group, provided, however, that R^1 and R^2 are not both hydrogen;

R^3 is hydrogen or lower alkyl; and R^4 and R^5 are the same or different groups and each is a fluoro, bromo, chloro or methyl group.

4,220,592

SYNTHESIS OF SUBSTITUTED PHENYLACETIC ACID

Keiji Kagawa, Oita; Naoya Kanda, Toyonaka; Fujio Masuko, Ibaraki, and Hirotoshi Nakanishi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 10, 1978, Ser. No. 923,351

Claims priority, application Japan, Jul. 22, 1977, 52/88743

Int. Cl.[2] C07C *51/08*

U.S. Cl. 260—340.5 R **7 Claims**

1. A process for hydrolyzing a substituted phenylacetonitrile using an acid to produce the corresponding substituted phenyl acetic acid, characterized in that

(1) the hydrolysis is carried out in at least two steps,

(2) the acid to be used in a first reaction step is a waste acid produced in a second reaction step and if any, subsequent reaction step(s) thereof in a process carried out previously, and

(3) the acid to be used in a second reaction step and if any, subsequent reaction step(s) thereof is a waste acid produced in a second reaction step and subsequent reaction step(s) thereof in a process carried out previously, respectively, and a fresh acid,

wherein the amount of the acid to be used in the first reaction step is 0.5 to 3 moles per mole of the substituted phenylacetonitrile, the amount of the acid to be used in the second reaction step and the subsequent reaction step(s) if any, is 2 to 8 moles per mole of the substituted phenylacetonitrile, and the hydrolysis is carried out at a temperature of 80° to 250° C.

4,220,593

2-CYCLOPROPYL-4-ISOPROPYL-2,5,5-TRIMETHYL-1,3-DIOXANE AS ODORANT

Klaus Bruns, Krefeld-Traar; Jens Conrad, Hilden; Peter Meins, Mettmann; Hinrich Möller, Dusseldorf-Benrath, and Harald Schnegelberger, Leichlingen, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien(Henkel KgaA), Dusseldorf-Holthausen, Fed. Rep. of Germany

Division of Ser. No. 844,281, Oct. 21, 1977, Pat. No. 4,146,506. This application Oct. 27, 1978, Ser. No. 955,160

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648109

Int. Cl.[2] C07D *319/04*

U.S. Cl. 260—340.7 **1 Claim**

1. 2-cyclopropyl-4-isopropyl-2,5,5-trimethyl-1,3-dioxane.

4,220,594

HEXA- AND OCTAHYDRO-4,7-EPOXYISOBENZOFURAN-1-OL AND HEXA- AND OCTAHYDRO-5,8-EPOXY-1H-2-BENZOPYRAN-3-OL

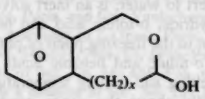
Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 848,543, Nov. 4, 1977, Pat. No. 4,143,054. This application Oct. 10, 1978, Ser. No. 949,838

Int. Cl.[2] C07D *311/78, 307/88*

U.S. Cl. 260—345.9 **10 Claims**

1. A compound having the formula



wherein x is 0 or 1 and the dotted line is an optional double bond.

4,220,595

OXIDATION OF BUTANE TO MALEIC ANHYDRIDE

Alan F. Dickason, Chester, and Wesley R. Cherry, Prospect Park, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed Oct. 17, 1973, Ser. No. 407,346

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **3 Claims**

1. A process for the vapor phase oxidation of butane to form maleic anhydride which comprises reacting butane with air or oxygen at a temperature of about 500°–650° C. in the presence of a catalyst composition consisting essentially of

(a) vanadium, phosphorous, oxygen and at least one alkaline earth metal selected from the group consisting of calcium, magnesium, and barium, wherein said catalyst contains from about 5–50 mole percent vanadium, 5–80 mole percent phosphorous, and from about 1–50 mole percent of said alkaline earth metal, based on the total metals of the compositon,

(b) said catalyst optionally containing a carrier, and the mole ratio of butane to oxygen in the feed stream is no greater than 1:4.

4,220,596

SEPARATION OF PHTHALIC ANHYDRIDE FROM VAPOR MIXTURE ALSO CONTAINING WATER VAPOR

Jeffrey H. Schott; David A. Palmer, both of Naperville, and Hobe Schroeder, Warrenville, all of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Dec. 15, 1978, Ser. No. 969,879

Int. Cl.[2] C07D *307/89*

U.S. Cl. 260—346.7 **4 Claims**

1. The method of separation of water, from 0 up to substantially all of the benzoic acid and from 0 up to about 55 weight percent of the o-toluic acid from a mixture of vapors which is at a temperature of from 180° C. up to 235° C. and a pressure of 760 mmHg to 100 mmHg wherein said mixture contains from 60% up to 86% phthalic anhydride, from 5% to 25% water, from 0.8% up to 10% benzoic acid, from 0.1% up to 4% o-toluic acid and up to 5% of compounds boiling at a temperature just above the boiling temperature of phthalic anhydride thereby leaving phthalic anhydride together with the remainder of benzoic acid, toluic acid and said compounds boiling just above phthalic anhydride as the phthalic anhydride product; which separation method is accomplished by the flow of fluids in a combination of zones including a rectifying zone above and a stripping zone below a contact zone which is in flow communication with both the rectifying zone and the stripping zone, a heating zone below and in fluid flow communication with the bottom of the stripping zone, a cooling zone in vapor flow communication with the top of the rectifying zone and in liquid flow communication with a single zone for both separating a liquid water layer and an immiscible liquid layer, decanting the water layer and recycling the immiscible liquid to the top of the rectification zone; by imposing a reduced pressure of from 50 to 150 mmHg on the cooling zone which by presure drop through the liquid in the rectifying, contacting and stripping zones imposes a pressure of from 100 to 250 mmHg on the heating zone; by introducing said 180° to 235° temperature vapor mixture into the contacting zone wherein phthalic anhydride vapor is cooled to the liquid state by direct heat exchange with downwardly flowing cooler reflux liquid thereby vapor-

izing a portion of the reflux liquid; which reflux liquid is immiscible with and inert to water; is an inert solvent or absorbent for phthalic anhydride, o-toluic acid and benzoic acid at a temperature down to the freezing point of phthalic anhydride; is miscible with o-toluic and benzoic acids at temperatures between their melting and boiling temperature; has a vapor pressure sufficiently above the vapor pressure of phthalic anhydride to effect their distillative separation but sufficiently low so as to be present in the liquid phase in the stripping zone; which does not form an azeotrope with phthalic anhydride, o-toluic acid or benzoic acid; and which is a single compound or a mixture of boiling point related compounds such that no component of said related compounds will remain with and contaminate phthalic anhydride; by contacting in the retifying zone the upwardly moving vapor of reflux liquid, water, o-toluci acid and benzoic acid with reflux liquid in the liquid state to cool said acids to a temperature between their melting and boiling temperatures, thereby dissolving or absorbing said acids in concentrations increasing with the downward movement of the liquid state of the reflux liquid and increasing the concentration of water vapor in the upwardly moving vapors of the reflux liquid; by withdrawing the mixture of water and reflux liquid vapors from above the cool reflux liquid's entrance into the rectifying zone; by charging the withdrawn vapor mixture to the cooling zone operated at a temperature between boiling and freezing temperature of water at 50 to 150 mmHg to cool the vapors of water and reflux liquid to the liquid state for their flow into the separation-decantation zone for discard of the liquid water and recycle of cool liquid state of reflux liquid to the top of the rectifying zone; by maintaining the heating zone at a temperature of from 200° C. up to 230° C. to vaporize a portion of the liquid phthalic anhydride product flowing into the heating zone from the stripping zone to provide said zone the heat by heat exchange between the phthalic anhydride product vapors and the reflux liquid in the stripping zone to separate in the bottom portion thereof vaporized reflux liquid for upward flow therein, and liquid phthalic anhydride product for downward flow therein to the heating zone; and by withdrawing a portion of the liquid phthalic anhydride product from the heating zone.

4,220,597

PROCESS FOR THE PREPARATION OF ANTHRAQUINONE

Kurt Halcourt, Leverkusen; Paul Losacker, Leichlingen; Manfred Martin, Cologne; Norbert Schenk, and Wulf Schwerdtel, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengeselischaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 815,044, Jul. 12, 1977, abandoned. This application Jan. 25, 1979, Ser. No. 6,402

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634605

Int. Cl.[2] **C07C** *49/68*

U.S. Cl. 260—369 **8 Claims**

1. In a process for the preparation of anthraquinone by catalytic oxidation of naphthalene in the gas phase to provide a reaction product, obtained by quenching, cooling or quenching and cooling, containing naphthaquinone and phthalic anhydride, treating said reaction product directly with butadiene to provide tetrahydroanthraquinone, oxidation by means of molecular oxygen of the tetrahydroanthraquinone contained in this reaction product, to give anthraquinone, and separation of naphthalene, phthalic anhydride, anthraquinone and by-products by distillation, the gases produced in the quenching, cooling, or quenching and cooling of the gases from the naphthalene oxidation and the gases from the oxidation of the tetrahydroanthraquinone to give anthraquinone being completely or partially recycled to the oxidation of naphthalene, characterized in that compounds with an alkaline reaction are introduced in an amount of 0.001 to 0.1% by weight relative to the naphthalene converted in the naphthalene oxidation between the naphthalene oxidation and the reaction with butadiene, or into the gas streams which are recycled to the oxidation of naphthalene.

4,220,598

METHOD AND REAGENTS FOR MEASURING THE LEVEL OF CONJUGATED BILE ACIDS

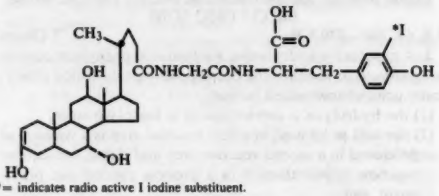
Harry F. Hixson, Jr., Libertyville; Billy J. Green, Vernon Hills; Laurence M. Cummins, Libertyville, and John W. Cole, Deerfield, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 677,586, Apr. 16, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,095

Int. Cl.[2] **C07J** *9/00*

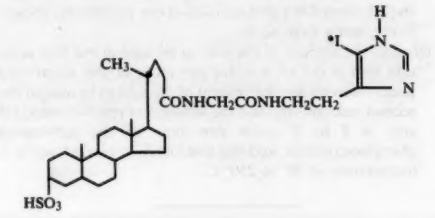
U.S. Cl. 260—397.1 **2 Claims**

1. A compound of the formula:



*= indicates radio active I iodine substituent.

2. A compound of the formula:



4,220,599

ORAL PHARMACEUTICAL PREPARATION HAVING ANDROGENIC ACTIVITY

Johannes van der Vies, Oss, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

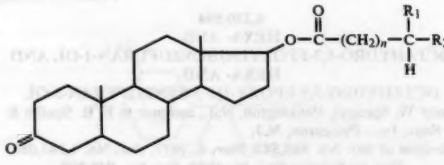
Continuation of Ser. No. 850,151, Nov. 10, 1977, which is a continuation-in-part of Ser. No. 691,103, Feb. 8, 1976, Pat. No. 4,098,802, which is a continuation-in-part of Ser. No. 550,397, Feb. 18, 1975, abandoned. This application Nov. 2, 1978, Ser. No. 957,252

Claims priority, application Netherlands, Feb. 28, 1974, 7402689

Int. Cl.[3] **A61K** *31/56*

U.S. Cl. 260—397.4 **5 Claims**

4. A steriod ester having the formula:



wherein:

(a) the dotted line indicates the optional presence of a double bond;

(b) n=0 or 1;
(c) R_1 is methyl; and
(d) R_2 is selected from the group consisting of an aliphatic hydrocarbon of 8 carbons and cyclohexyl; or R_1 and R_2 form together with the carbon atom to which they are attached a cycloaliphatic group having 8 carbon atoms, with the proviso that the total number of carbon atoms in the ester group is in the range of 9–16 carbon atoms.

4,220,600

POLYCARBOSILANE, PROCESS FOR ITS PRODUCTION, AND ITS USE AS MATERIAL FOR PRODUCING SILICON CARBIDE FIBERS

Seishi Yajima; Kiyohito Okamura, and Yoshio Hasegawa, all of Oharai, Japan, assignors to The Foundation: The Research Institute for Special Inorganic Materials, Asahi, Japan

Filed Oct. 23, 1978, Ser. No. 953,518
Claims priority, application Japan, Oct. 26, 1977, 52/127629; Oct. 26, 1977, 52/127630; Dec. 10, 1977, 52/148488
Int. Cl.[2] C07F *7/08*
U.S. Cl. 556—434 7 Claims

1. A process for producing polycarbosilane partly containing siloxane bonds, which comprises adding 0.01 to 15% by weight of polyborosiloxane having phenyl groups in at least a part of the side chains of Si with its skeletal structure being composed of B, Si and O to a polysilane having the structure

wherein n is at least 3, and R_1 and R_2, independently from each other, represent methyl, ethyl, phenyl or hydrogen; and heating the polymer mixture in an atmosphere inert to the reaction thereby to polymerize it.

4,220,601

PROCESS FOR THE CONTINUOUS MANUFACTURE OF 3-NITRO-4-ACETYLAMINO-TOLUENE AND CORRESPONDING APPARATUS

Max Schneider, Kelkheim; Lothar Schmitt, and Hartmut Heise, both of Bad Soden am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,360
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723247
Int. Cl.[2] C07C *103/375*
U.S. Cl. 260—562 R 6 Claims

1. A process for the continuous manufacture of 3-nitro-4-acetamino-toluene which comprises the steps of

first, feeding a solution of 4-acetamino-toluene in sulfuric acid into a cooled circulating reaction mixture having a circulating mass therein in such a manner to cause a homogeneous distribution of the 4-acetamino-toluene in the circulating reaction mixture; and

second, at a point downstream of the first step, nitrating the 4-acetamino-toluene at a temperature which ranges between room temperature and a slightly elevated temperature by feeding aqueous 40 to 65% by weight nitric acid, in the absence of sulfuric acid, into the circulating reaction mixture containing the homogeneous distribution of the 4-acetamino-toluene in such a manner to cause a thorough intermixing of the aqueous nitric acid and the 4-acetamino-toluene in the circulating reaction mixture.

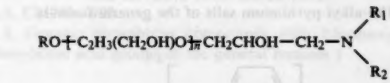
4,220,602

CATIONIC SURFACE-ACTIVE AGENTS

Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Mitry-Mory, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 742,671, Nov. 17, 1976, Pat. No. 4,096,332, which is a division of Ser. No. 547,465, Feb. 6, 1975, Pat. No. 4,009,255, which is a division of Ser. No. 187,151, Oct. 6, 1971, Pat. No. 3,879,464, Continuation-in-part of Ser. No. 655,336, Jul. 24, 1967, abandoned. This application Mar. 29, 1978, Ser. No. 891,455
Claims priority, application Luxembourg, Jul. 26, 1966, 51645; May 12, 1967, 53667
Int. Cl.[2] C07C *93/06*
U.S. Cl. 260—570.7 2 Claims

1. A cationic surface-active agent comprising a mixture of compounds having the formula



wherein R is alkyl phenyl having 8–22 carbon atoms, R_1 and R_2 each independently are selected from the group consisting of lower alkyl having 1–4 carbon atoms and hydroxy lower alkyl having 1–4 carbon atoms, and n has a statistical average value of 0.5–10.

4,220,603

PHARMACEUTICALLY ACTIVE (OMEGA-AMINOALKOXY)BIBENZYLS

Ryoji Kikumoto, Machida; Kunihiro Ninomiya; Harukazu Fukami, both of Yokohama, and Hiroto Hara, Machida, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Filed Sep. 19, 1978, Ser. No. 943,621
Claims priority, application Japan, Oct. 7, 1977, 52/120710; Jul. 14, 1978, 53/85833; Aug. 1, 1978, 53/94044
Int. Cl.[2] C07C *93/06*
U.S. Cl. 260—570.7 4 Claims

1. A compound which is 2-(2-dimethylaminoethoxy)bibenzyl.

4,220,604

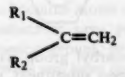
OXIDATIVE REARRANGEMENT OF OLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 14, 1978, Ser. No. 924,537
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.[2] C07C *45/04*
U.S. Cl. 568—401 8 Claims

1. A process for the conversion of an isoolefin reactant to a ketone which comprises contacting:

(a) an isoolefin which has the general formula:



wherein R_1 and R_2 are alkyl radicals containing from 1 to about 8 carbon atoms per radical with

(b) oxygen in

(c) a reaction diluent comprising at least two liquid phases wherein at least one liquid phase is an aqueous phase, in the presence of

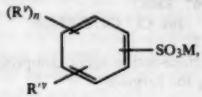
(d) a catalyst comprising palladium, copper, and an alkali metal or alkaline earth metal chloride, and

(e) a surfactant, wherein said surfactant is selected from the group consisting of:

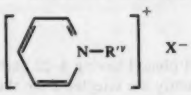
(1) quaternary ammonium salts of the general formula

$(R''')_4N^+X^-$

(2) alkali metal alkyl sulfates of the general formula $R''OSO_3M$,
(3) alkali metal salts of alkanoic acids of the general formula $R''CO_2M$,
(4) alkali metal salts of alkaryl sulfonic acids of the general formula



(5) 1-alkyl pyridinium salts of the general formula



wherein R''' is an alkyl radical of from 1 to 20 carbon atoms and wherein the total number of carbon atoms in said quaternary ammonium salt is from about 8 to about 30 carbon atoms; X^- is selected from the group consisting of Br^-, Cl^-, I^-, F^-, $R'''CO_2^-$, QSO_3^-, BF_4^-, HSO_4^- wherein Q is an aryl or alkaryl radical of 6 to 10 carbon atoms; R^v is an alkyl radical of from 10 to about 20 carbon atoms; M is an alkali metal; R^v is an alkyl radical of 1 to 4 carbon atoms and wherein n is 0 or an integer of from 1 to 4,

under such reaction conditions that the isoolefin undergoes oxidative rearrangement to a ketone.

4,220,605

PROCESS FOR THE PRODUCTION OF INTERMEDIATE OXIDATION PRODUCTS OF TOLUENE HAVING ETHER LINKAGES

Juichi Imamura, Chofu, Japan, assignor to Director General of Agency of Industrial Science and Technology; Sanko Chemical Co. Ltd. and Nippon Soda Co. Ltd., all of Tokyo, Japan

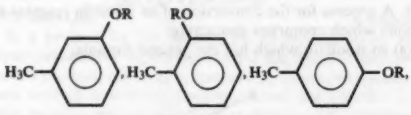
Filed Dec. 23, 1977, Ser. No. 863,954

Claims priority, application Japan, Dec. 27, 1976, 51/158756; Dec. 27, 1976, 51/158757; Aug. 15, 1977, 52/97646

Int. Cl.² C07C *45/00, 37/00*

U.S. Cl. 568—432 **9 Claims**

1. In the process for the production of alcohols and/or aldehydes which comprises subjecting a toluene derivative having ether radicals of the general formula selected from



wherein R is a hydrocarbyl group with 1–20 carbon atoms which may carry an inert substituent, said toluene derivative being the starting compound for the oxidation reaction in the liquid phase with molecular oxygen to form the corresonding alcohol and/or aldehyde, the improvement wherein the said oxidation reaction is effected under the following combination of conditions: (a) the use, as solvent, of a lower saturated fatty acid and/or anhydride thereof; (b) a partial pressure of oxygen of 0.1–50 Kg/Cm^2 absolute; (c) a temperature in the range of 30°–200° C.; (d) in the presence of a soluble cobalt salt in the amount of at least 0.01 moles per mole of toluene derivative; (e) in the presence of a bromine ion-supplying substance in an amount of 0.0001–0.5 moles per mole of toluene derivative and concurrently in an amount of 0.001–10 moles per mole of cobalt salt; (f) in such a manner that the conversion rate of said toluene derivative does not exceed 60% when the ether group is in the meta- position; does not exceed 80% when the ether group is in the ortho- position; and does not exceed 90% when the ether group is in the para- position.

4,220,606

CYCLIC HYDROCARBON PERFLUORINATION PROCESS

Robert E. Moore, Wilmington, Del., assignor to Suntech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 968,942, Dec. 13, 1978, abandoned, which is a continuation of Ser. No. 898,058, Apr. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 771,873, Feb. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 706,315, Jul. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 579,766, May 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 530,791, Dec. 9, 1974, abandoned. This application Jul. 2, 1979, Ser. No. 54,332

Int. Cl.² C07C *23/18*

U.S. Cl. 260—648 F **42 Claims**

1. A process for the perfluorination of non-aromatizable polycyclic hydrocarbons which comprises:

(A) partially fluorinating a polycyclic hydrocarbon or a carbonyl, hydroxyl, chlorinated, or brominated derivative thereof, by contacting it in a first reaction zone with a fluorinating agent selected from the group consisting of HF, HF-pyridine, AgF_2, MnF_3, SF_4, SbF_5, $KCoF_4$ and fluoroolefins, in the liquid phase under conditions sufficient to provide not more than about 50% fluorination corresponding to perfluorination;

(B) further fluorinating said partially fluorinated polycyclic hydrocarbon in the vapor phase in a second reaction zone with CoF_3 at a temperature of no greater than about 50° C. above the boiling point of the fluorinated material to provide a highly fluorinated material having a degree of fluorination corresponding to no more than about 75–95% of perfluorination; and

(C) thereafter contacting said highly fluorinated material with CoF_3 in the vapor phase at temperatures about 100° C. higher than were first employed in (B) above, to provide a substantially perfluorinated polycyclic hydrocarbon.

4,220,607

STABILIZED PERCHLOROETHYLENE

Dominik Dempf, Mehring-Oed; Rudolf Knabl, Burghausen; Ludwig Schmidhammer, Haiming, Markti, and Wilhelm Mack, Mehring, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,388

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811779; Dec. 13, 1978, 2853848

Int. Cl.² C07C *17/40*

U.S. Cl. 260—652.5 R **5 Claims**

1. Stabilized perchloroethylene, containing

(a) 0.001 to 0.01% by weight N-alkylmorpholine with straight- or branched-chain alkyl chains having 1–5 carbon atoms, and mixtures thereof;

(b) 0.001 to 0.01% by weight alkylphenols with straight- or branched-chains, the alkyl chains having 1–18 carbon atoms in o- or p-positions, or both, and mixtures thereof;

(c) 0.0005 to 0.002% by weight of diisopropylamine; and

(d) 0.05 to 0.5% by weight of cyclohexeneoxide.

4,220,608

PREPARATION OF 3,3,3-TRIFLUOROPROPENE-1

Andrew E. Feiring, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 6, 1979, Ser. No. 45,959
Int. Cl.[2] C07C *19/08*
U.S. Cl. 260—653.3 14 Claims

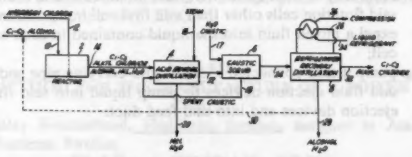
1. Process for preparing 3,3,3-trifl uoropropene-1 by contacting and reacting at least one of 1,1,1,3-tetrachloropropane, 1,1,3-trichloropropene-1 and 3,3,3-trichloropropene-1 and HF, under autogeneous pressure, at 140°–250° C., in the presence of at least a catalytic amount of an organic monoamine, a salt of the monoamine or an alkylene diamine, said monoamine and salt being of the formula $R_3N.(R'X)_n$ wherein n is 0 or 1, X is an appropriate anion, each R and R' is selected independently from H, alkyl of 1–16 carbon atoms, cycloalkyl of 6–10 carbon atoms, aryl of 6–10 carbon atoms and alkylaryl of 6–10 carbon atoms, provided, however, when n is 0, no more than two of the R groups are H and when n is 1, no more than three of the R and R' groups are H, and provided, however, R_3N taken jointly is piperidine, pyrrolidine, indoline, isoindoline, pyridine, quinoline or isoquinoline, each optionally substituted with 1–3 methyl groups, said alkylene diamine being of the formula $R''_2—(CH_2)_m—NR''_2$ wherein m is 2–10 and each R'' is selected independently from H, alkyl of 1–4 carbon atoms and phenyl, provided, however, when m is 2, each R'' is selected independently from alkyl of 1–4 carbon atoms and phenyl.

4,220,609

PROCESS FOR THE RECOVERY OF ALKYL CHLORIDES

Harry R. McEntee, Waterford, and Frank S. Potochnik, Scotia, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 641,655, Dec. 17, 1975, Pat. No. 4,025,352, which is a continuation-in-part of Ser. No. 359,842, May 14, 1973, abandoned. This application Dec. 9, 1976, Ser. No. 748,740
Int. Cl.[2] C07C *17/00*
U.S. Cl. 260—657 18 Claims



1. In a process for the preparation of a C_1–C_3 alkyl chloride by reacting a C_1–C_3 alcohol and hydrogen chloride in a production reactor to produce a superheated vapor of said C_1–C_3 alkyl chloride, by-product water, unreacted hydrogen chloride and unreacted C_1–C_3 alcohol, the improvement which comprises:

(a) feeding said superheated vapor, steam and a spent aqueous caustic recycle solution to an acid removal distillation vessel to produce an acid by-product solution of the major proportion of the hydrogen chloride and removing the acid by-product solution from the vessel;

(b) withdrawing the gaseous C_1–C_3 alkyl chloride and the gaseous unreacted C_1–C_3 alcohol from the acid removal distillation vessel and passing them into a scrubbing vessel, intimately contacting them therein with an aqueous caustic solution to remove the remaining proportion of the hydrogen chloride and to produce a spent aqueous caustic recycle solution and recycling said spent solution from the scrubbing vessel to the acid removal distillation vessel in step (a);

(c) withdrawing the gaseous C_1–C_3 alkyl chloride and the gaseous unreacted C_1–C_3 alcohol from the scrubbing vessel and passing them into a refrigerated recovery distillation vessel wherein the unreacted C_1–C_3 alcohol is liquified and removing the liquified C_1–C_3 alcohol from the vessel; and

(d) withdrawing and recovering the gaseous C_1–C_3 alkyl chloride from the refrigerated recovery distillation vessel.

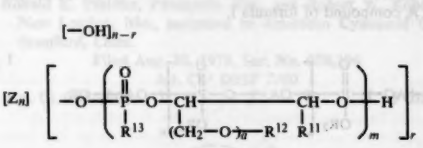
4,220,610

ORGANIC PHOSPHORUS COMPOUNDS WITH 2-HYDROXYALKYL-PHOSPHONIC ACID GROUPS

Walter Dürsch, and Fritz Linke, 393.3, both of Königstein, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

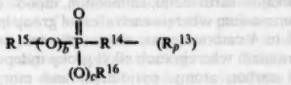
Filed Feb. 9, 1979, Ser. No. 10,700
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 2806049
Int. Cl.[2] C07F *9/40*; D06M *13/28*
U.S. Cl. 260—928 3 Claims

1. Organic phosphorus compounds with 2-hydroxyalkyl-phosphonic acid groups of the general formula I

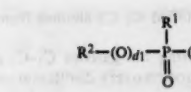


(I)

the individual symbols in the above formula I having the following meaning: n is an integer of 1 to 6, r is an integer from 1 to 6; m is 1 if r>n or is a number from 1 to 150; a is 0 or 1; R^{11} is a saturated or unsaturated or branched alkyl radical with 1–5 carbon atoms or, hydrogen, R^{12} is saturated or unsaturated or branched alkyl radical with 1–22 carbon atoms, which may be substituted by 1 or two chlorine or bromine atoms, or a cycloalkyl radical with 6–10 carbon atoms, an aryl or aralkyl radical with up to 18 C atoms, or crotonyl, acroyl or methacroyl or—but only if a=0—hydrogen, and R^{13} has the same meaning as R^{12} with the exception of hydrogen and can additionally be a monovalent phosphorus-containing radical of the formula R_p^{13}



in which b and c represent 0 or 1, R^{14} represents C_1–C_{10}-alkylene, cycloalkylene, arylene or aralkylene, and also R^{15} and R^{16} represent saturated or unsaturated or branched C_1–C_5-alkyl radicals; and z_n is a n-valent radical from the group comprising straight-chain or branched aliphatic or araliphatic hydrocarbon radicals with 1 to 22 which may be interrupted by up to two carboxylate groups (—C—CO—) or up to 2 —S— or NR^2 radicals in which R^2=(C_1—C_4)-alkyl, or substituted by fluorine, chlorine or bromine atoms or carboalkoxy groups or carboxamide, carbamate or urea groups or by primary, secondary or tertiary amino groups, or hydrocarbon radicals which contain ether groups and have equivalent weights of up to 8000 and are obtained by oxethylation or oxpropylation of n-valent aliphatic, araliphatic or aromatic hydroxy compounds, amines or mono-or di-carboxylic acids with 1–22 C atoms, in which the araliphatic or the aromatic radicals are derived from benzene, alkyl- or alkylene=benzenes with up to 18 C atoms, naphthalene, diphenyl, diphenylmethane, diphenylethane or 2,2-diphenylpropane and may be substituted in the nucleus by 1 ro 2 methoxy or ethoxy groups or can be substituted, in the nucleus or on the side chains by F, Cl or Br atoms, or phosphorus-containing radicals of the general formula



in which d_1 and d_2 independently of one another are 0 and 1 and R^1 is alkyl, hydroxyalkyl, (C_1-C_2)-alkylated or -dialkylated aminoalkyl, halogeno- alkyl with 1 to 3 C atoms, alkenyl with 2 or 3 C atoms or phenyl, which may be substituted by 1 or 2 halogen atoms, and R^2 and R^3 have the same meaning as R^1 with the proviso that at least one of the radicals R^2 or R^3 is an alkylene radical with 2–5 C atoms.

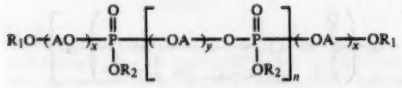
4,220,611

POLYOXYALKYLENE BRIDGED PHOSPHATE ESTERS

Harold P. Wolf, Whippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jun. 29, 1978, Ser. No. 920,368
Int. Cl.² C07F 9/08
U.S. Cl. 260—929 **12 Claims**

1. A compound of formula I,



I

wherein each R_1, independently, is the residue of a straight or branched chain C_6–C_{22} fatty alcohol or the residue of a mono- or dialkylphenol wherein the alkyl group of the mono- or each alkyl group of the dialkylphenol independently has from 6 to 12 carbon atoms and is straight or branched,

each A, independently, is a divalent, aliphatic, straight or branched chain hydrocarbylene group having from 2 to 6 carbon atoms,

each x, independently, is an integer 1 to 100,

each y, independently, is an integer 2 to 30,

n is an integer 1 to 3, and

the R_2's have the same significance and are hydrogen or a cation selected from the group consisting of alkali metal, alkaline earth metal, ammonium, mono-, di- and trialkanol ammonium wherein each alkanol group independently has 2 to 4 carbon atoms, mono-, di-, tri- and tetra-alkylammonium wherein each alkyl group independently has 1 to 4 carbon atoms, pyridinium and morpholinium, or a mixture of compounds of formula I.

4,220,612

FLOTATION CELL FEED DUCT

Vernon R. Degner, Sandy, Utah, and William V. Colbert, Sacramento, Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Continuation of Ser. No. 918,982, Jun. 26, 1978, which is a continuation of Ser. No. 695,881, Jun. 14, 1976, abandoned. This application Apr. 23, 1979, Ser. No. 32,069
Int. Cl.² B03D 1/24
U.S. Cl. 261—76 **8 Claims**

1. A dispersed gas flotation machine for dispersing gas bubbles throughout contained liquid comprising:

a. a housing and a plurality of flotation cells, mounted adjacent one another in a horizontal series to form at least a first cell and a last cell in said housing and each of said cells containing a liquid body;

b. means for transferring liquid from cell to cell;

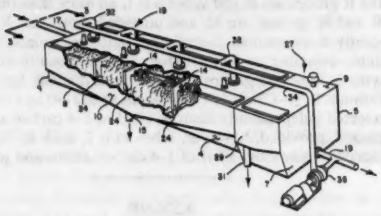
c. means connected to said housing for introducing liquid for processing thereinto, said introduction means including a feed duct located only in said first cell of said plurality of cells and having:

(i) a first hollow tubular member which has a first end and an open end through which a mixture of gas and liquid is expelled and which is of substantially constant diameter throughout its length;

(ii) a second hollow tubular member coupled to said first hollow tubular member to form a space between said first and second hollow tubular members around the open end of said first tubular member said second tubular member having a substantially constant diameter throughout its length;

(iii) means for introducing raw liquid into the space between said first and second hollow tubular members;

(iv) a liquid-carrying pipe sealingly connected in communication with said first end of said first tubular member, said liquid-carrying pipe extending inside said first tubular member substantially less than length of said first tubular member so that an expansion chamber is formed



between the open end of said liquid-carrying pipe and the open end of said first tubular member; and

(v) gas introduction means for introducing gas into the interior of said expansion chamber for mixing with the liquid in said expansion chamber;

d. removal means for removing processed liquid from said housing;

e. means for removing froth from the surface of the liquid in said housing;

f. a plurality of fluid ejection devices mounted one in each of said flotation cells other than said first cell in a position to expel a mixed fluid into the liquid contained in each said cell;

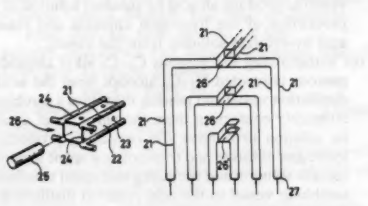
g. pump means connected to said liquid-carrying pipe and to said fluid ejection devices to pump liquid into said fluid ejection devices and into said feed duct.

4,220,613

LIQUID FEEDER

Yasufumi Nakajima, and Hayami Nakatani, both of Kobe, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 5, 1979, Ser. No. 17,236
Claims priority, application Japan, Mar. 9, 1978, 53-26012
Int. Cl.² B01F 3/04
U.S. Cl. 261—152 **3 Claims**



1. A liquid feeder for feeding liquid into a boiler or preboiler having tubes for carrying a cooling fluid, comprising an assembly of chemicals feeding nozzles, each of which is fabricated by securing wall members, each having nozzle holes between

pairs of adjacent ones of said tubes, thereby forming a boxlike nozzle for the passage of the liquid, said tubes being those of a flow path or circuit through which the fluid in the boiler or preboiler unit is taken out and is returned thereto.

4,220,614

SOLID SOLUTION CARBIDE NUCLEAR FUELS

Leonard R. Fleischer, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 4, 1967, Ser. No. 629,863
Int. Cl.² G21C *21/00*
U.S. Cl. 264—0.5 **5 Claims**

1. A method for making a nuclear fuel element composed of a (U,Zr)C solid solution comprising the steps of;

(a) forming a compact from a mixture of zirconium, carbon and uranium monocarbide powders,

(b) heating the compact initially to a temperature sufficient to melt only the zirconium,

(c) holding the compact at this temperature for a time sufficient to entirely consume the liquid zirconium by interdiffusion with the other constituents to form zirconium carbide and a (U,Zr)C solid solution,

(d) heating the solid compact to a second higher temperature sufficient to melt the uranium monocarbide, and

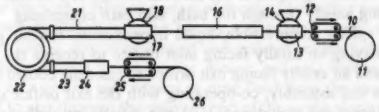
(e) holding the compact at said higher temperature for a time sufficient to completely consume the liquid uranium monocarbide by interdiffusion with the solid constituents of the compact to form (U,Zr)C solid solution whereby the compact is composed of a single phase homogeneous solid solution of (U,Zr)C.

4,220,615

METHOD FOR THE MANUFACTURE OF A POWER CABLE

Stanley Sommarlund, Huddinge, Sweden, assignor to Asea, Vasteras, Sweden

Filed Dec. 6, 1978, Ser. No. 967,021
Claims priority, application Sweden, Dec. 9, 1977, 7713997
Int. Cl.² B29F *3/10*
U.S. Cl. 264—174 **6 Claims**



1. In a method for manufacturing a power cable wherein a polymeric, electrically-conducting layer is extruded into surrounding relationship with respect to a cable conductor, an initially thermoplastic, heat cross-linkable, polymeric layer of insulation is extruded at a predetermined temperature into surrounding relationship with respect to the conducting layer, and thereafter cross-linking is caused to occur in said insulation layer by heating the composite under pressure, the improvement which comprises:

using for said polymeric, electrically-conducting layer a material characterized by sufficient resistance to indentation at said predetermined extrusion temperature to prevent the same from being deformed or damaged during the extrusion of said insulation layer and during said cross-linking operation, said material being sufficiently resistant to indentation that the same will receive an indentation which amounts to no more than 10 percent of the original thickness of a test specimen of said material, when formed by compression-moulding at 175° C. and when having a thickness of 1.50 mm and a diameter of 15.0 mm, and when such specimen is subjected to loading with a pressure of 13 kp/cm² for 5 minutes at a temperature of 125° C. and the indentation is then measured after the specimen with the remaining load has been allowed to cool for one hour at room temperature; and

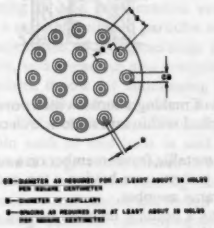
heating said cable to a temperature which is lower than said predetermined temperature but which is within 75° C. thereof prior to said extrusion of said insulation layer.

4,220,616

MELT-SPINNING ACRYLONITRILE POLYMER FIBER USING SPINNERETTE OF HIGH ORIFICE DENSITY

Ronald E. Pfeiffer, Pensacola, Fla., and Robert W. Roberts, New London, Mo., assignors to American Cyanamid Co., Stamford, Conn.

Filed Aug. 30, 1978, Ser. No. 938,196
Int. Cl.² D01F *7/00*
U.S. Cl. 264—206 **5 Claims**



1. A process for melt-spinning an acrylonitrile polymer fiber which comprises providing a homogeneous fusion melt of a fiber-forming acrylonitrile polymer and water at a temperature above the boiling point of water at atmospheric pressure and at a temperature and pressure which maintains water in single phase with said polymer and extruding said fusion melt through a spinnerette assembly containing a spinnerette plate having an orifice density of at least about 25 per square centimeter, each orifice consisting of a capillary of about 200–400 micron diameter centered in a counterbore, directly into a steam-pressurized solidification zone maintained under conditions such that the rate of release of water from the nascent extrudate avoids deformation thereof.

4,220,617

PROCESS FOR MELT-SPINNING ACRYLONITRILE POLYMER FIBER

Ronald E. Pfeiffer, Pensacola, and Stanley E. Peacher, Milton, both of Fla., assignors to American Cyanamid Co., Stamford, Conn.

Filed Aug. 30, 1978, Ser. No. 938,197
Int. Cl.² D01F *6/18*
U.S. Cl. 264—206 **3 Claims**

1. A process for melt-spinning acrylonitrile polymer fiber which comprises providing a homogeneous melt of an acrylonitrile fiber-forming polymer of kinematic molecular weight in the range of about 30,000 to 60,000 and water at a temperature above the boiling point of water at atmospheric pressure and at a temperature and pressure which maintains water in single phase with said polymer and extruding said fusion melt through a spinnerette assembly containing a spinnerette plate

having a density of orifices of a diameter of about 60 to 160 microns of at least about 25 per square centimeter directly into a steam-pressurized solidification zone maintained under conditions such that the rate of release of water from the nascent extrudate avoids deformation thereof.

4,220,618

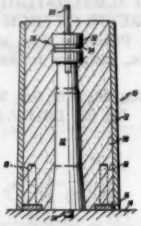
METHOD OF MAKING A MOLD WITH A CORE SUPPORTING BUSHING

Fred W. Pierson, Sr., Grand Rapids; Fred W. Pierson, Jr., Wyoming, and Gordon J. Weidenfeller, Grandville, all of Mich., assignors to M & T Manufacturing Company, Grand Rapids, Mich.

Division of Ser. No. 791,517, Apr. 27, 1977, Pat. No. 4,125,931, which is a division of Ser. No. 599,145, Jul. 25, 1975, Pat. No. 4,040,597. This application Jul. 26, 1978, Ser. No. 928,169

Int. Cl.² B29C *1/02*

U.S. Cl. 264—219 **3 Claims**



1. A method of making a mold with a core supporting bushing member locked within said mold which comprises the steps of

(a) placing a metallic frame member on a support surface and locating a pattern core having a top end bore within said metallic frame member,

(b) positioning a bushing member having a cylindrical bore extending therethrough atop said pattern core and establishing a removable press fit connection between said bushing member and said spout pattern core with a cylindrical pin member which extends at least partially into each of said bushing member and said spout pattern core,

(c) positioning an annular striker plate member on said support surface,

(d) pouring said mold within said frame member and around said pattern core and said hollow bushing member to interlock said annular striker plate member with said mold, and

(e) removing said pattern core from said metallic frame member.

4,220,619

PROCESS FOR FORMING THE CONNECTION BETWEEN TWO GROUPS OF GLASS FIBERS

Ralf Kersten, Rottach-Egern, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

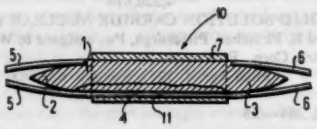
Division of Ser. No. 635,276, Nov. 26, 1975, Pat. No. 4,103,987. This application Mar. 23, 1978, Ser. No. 889,445

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1974, 2456552

Int. Cl.² B29C *27/20*

U.S. Cl. 264—230 **2 Claims**

1. A method of producing a connection between a first and second group of fibers comprising the steps of providing a connecting device having an elongated carrier member having a plurality of longitudinal extending grooves and a tube of shrinkable material, telescopically assemblying the carrier member within the tube, inserting the fibers of the first group into the one end of longitudinal grooves with one fiber being disposed in each groove, shrinking an end zone of the tube into engagement with the fibers of the first group, inserting the fibers of the second group into the grooves from the opposite end with one fiber disposed in each groove and the end faces of the fibers contacting the end faces of the fiber from the first



group, shrinking the opposite end of the tube into engagement with the inserted fibers of the second group and subsequently shrinking the tube over its remaining region onto the carrier member and the fibers disposed in the grooves therein.

4,220,620

QUENCH BATH

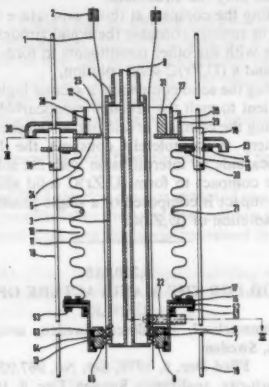
Michael L. Clifford, St-Martens-Latem, Belgium, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 804,376, Jun. 7, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,170

Claims priority, application United Kingdom, Mar. 21, 1977, 11807/77

Int. Cl.² B29F *3/08*

U.S. Cl. 264—560 **11 Claims**



1. A quench bath for supplying and maintaining an annular pool of cooling liquid at the external surface of a tubular form moving axially through the bath, said bath comprising

an axially compressible, liquid impermeable, tubular jacket having an axially facing inlet orifice to receive the form and an axially facing exit orifice to eject the cooled form, a seal assembly, co-operating with the exit orifice of the jacket and including at least one radially inwardly extending resilient annular sealing member for engagement with the external surface of the tubular form, said seal assembly and jacket together providing a liquid-retaining chamber within the jacket on the upstream side of said seal assembly, inlet means operatively associated with said jacket to introduce cooling liquid into the chamber,

outlet means operatively associated with said jacket to discharge cooling liquid from the chamber, and

support means located exteriorly of the jacket and cooperating therewith to releasably support the jacket in an axially extended configuration.

11. A method of forming an oriented polymeric tubular film comprising extruding a molten film-forming polymeric mate-

rial in tubular form, passing the extruded form over an internal mandrel to cool the internal surface of the form, simultaneously passing the extruded form through a quench bath to cool the external surface of the form, reheating the cooled form, and inflating and simultaneously longitudinally stretching the reheated form, said bath comprising an axially compressible, liquid impermeable, tubular jacket having an axially facing inlet orifice to receive the form and an axially facing exit orifice to eject the cooled form, a seal assembly, co-operating with the exit orifice of the jacket and including at least one radially inwardly extending resilient annular sealing member for engagement with the external surface of the tubular form, said seal assembly and jacket together providing a liquid-retaining chamber within the jacket on the upstream side of said seal assembly, inlet means operatively associated with said jacket to introduce cooling liquid into the chamber, outlet means operatively associated with said jacket to discharge cooling liquid from the chamber, and support means located exteriorly of the jacket and cooperating therewith to releasably support the jacket in an axially extended configuration.

4,220,621

BACKWASH SYSTEM FOR DILUTING APPARATUS

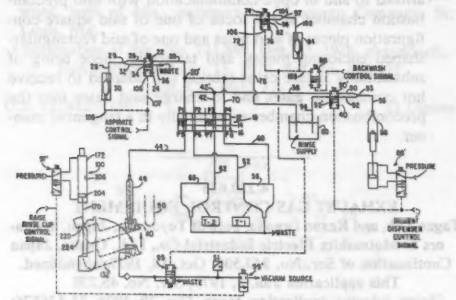
Ronald O. Simpson, and Pedro P. Cabrera, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 906,235, May 15, 1978, Pat. No. 4,148,859. This application Feb. 23, 1979, Ser. No. 14,306

The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.

Int. Cl.[2] G01N *1/14*

U.S. Cl. 422—103 **25 Claims**



1. A backwash system capable of being operationally coupled for use with a diluting system of the type including probe means which include a probe having a combined intake and delivery end, a source of diluent and conduit means linking said diluent source to said probe means, and said backwash system arranged to pass diluent as rinse fluid from the source thereof to and through the delivery end of the probe along the path taken during intake but in a direction opposite thereto at a predetermined stage in the operation of the diluting system, and a receptacle vessel for receiving the backwashed liquid from the probe means, means carried by one of said receptacle vessel and probe means to establish a sealed engagement therebetween, means mounting said probe means and said receptacle vessel for relative movement along a predetermined path between a location displaced from the delivery end of said probe means and a location engaging the delivery end of said probe means in a sealed coupling therewith, means defining said path of movement, drive means moving at least one of said receptacle vessel and probe means along said path of movement.

4,220,622

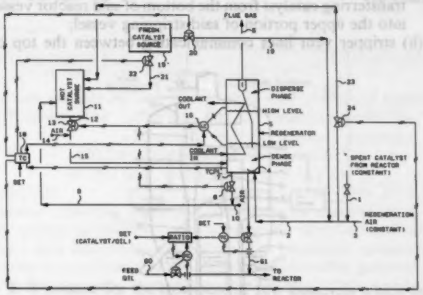
APPARATUS FOR REGENERATION OF FLUIDIZED PARTICLES OR CATALYSTS

Carl S. Kelley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 873,580, Jan. 30, 1978, Pat. No. 4,160,743. This application Feb. 5, 1979, Ser. No. 9,323

Int. Cl.[2] B01J *8/24, 8/26*

U.S. Cl. 422—109 **6 Claims**



1. An apparatus comprising a regeneration vessel means, means for maintaining in said regeneration vessel means a dense phase bed of a mass of fluidized particles and means for controlling the temperature of a regeneration thereof at an elevated temperature, said apparatus also comprising an auxiliary surge vessel means, means for maintaining in said surge vessel means a dense phase bed of a mass of said particles, means for continuously and directly circulating a mass of particles from within each of said beds in said regeneration vessel means, and in said surge vessel means, to within the bed of the other vessel means, means for sensing the temperature within said regeneration vessel means and means responsive to said temperature sensing means for controlling the temperature within the bed of said mass of said particles in said fluidized bed in said regeneration vessel means, by increasing the level of the bed in said regeneration vessel means when the temperature therein is tending to rise, said means for controlling comprising means for and adjusting the circulation of particles between said vessels to build up the level in said regeneration vessel means, and vice versa when the temperature therein is tending to fall.

4,220,623

FLUIDIZED CATALYTIC CRACKING REACTOR

Frederick C. Jahnke, Houston; John P. MacLean, Stafford; Dale Williams, Houston, and John D. Brown, The Woodlands, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 29, 1978, Ser. No. 891,414

Int. Cl.[2] B01J *8/26*; C10G *13/18, 35/14*

U.S. Cl. 422—144 **4 Claims**

1. In a Fluidized Catalytic Cracking Unit the combination comprising:

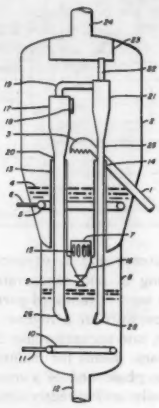
(a) a vertical, cylindrical reactor vessel for maintaining a dilute phase of catalyst suspended in hydrocarbon vapor above a fluidized dense phase bed of spent catalyst;

(b) an upwardly directed riser transport reactor communicating internally with said reactor vessel for discharging hydrocarbon vapor and spent catalyst into said reactor vessel;

(c) cyclone separator means in the upper portion of said reactor vessel for separating said dilute phase into hydrocarbon vapors and spent catalyst;

(d) hydrocarbon vapor outlet means in communication with said cyclone separator means for transferring separated hydrocarbon vapors from said cyclone separator means to processing facilities outside said reactor vessel;

(e) a cylindrical stripping vessel vertical disposed below said reactor vessel;
(f) spend catalyst collector means communicating with the interior of said reactor vessel through the bottom thereof for providing a static head of catalyst which will exceed the pressure differential between said reactor vessel and said stripping vessel;
(g) spent catalyst transfer means in communication with the lower interior portion of said spent catalyst collector means and with the interior of said stripping vessel for transferring catalyst from the bottom of said reactor vessel into the upper portion of said stripping vessel;
(h) stripper vent lines communicating between the top of



said stripping vessel and the upper portion of said reactor vessel for allowing flow of stripping vapors from the upper portion of said stripping vessel to the dilute phase region of said reactor vessel;
(i) cyclone separator catalyst diplegs extending from the bottom of said cyclone separator means within said reactor vessel through said stripper vent lines into said stripping vessel for providing a path of flow for separated catalyst from said cyclone separator means into said stripping vessel; and
(j) means for maintaining a column of catalyst in said diplegs to prevent blow-by of either hydrocarbon vapors from said cylcone separator means or stripping vapors from said stripping vessel through said diplegs.

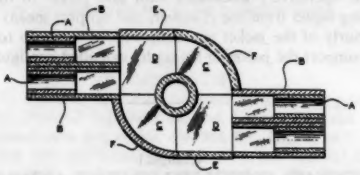
4,220,624

CARBON BLACK REACTOR WITH INTERCHANGEABLE REFRACTORY CERAMIC PROTECTIVE LINER ELEMENTS

Oliver K. Austin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 701,007, Jun. 29, 1976, Pat. No. 4,134,966. This application Nov. 3, 1978, Ser. No. 957,608
Int. Cl.[2] C09C *1/50*
U.S. Cl. 422—150 **2 Claims**

1. A furnace for manufacturing carbon black comprising:
(a) a refractory-lined reaction chamber of substantially circular cross section in open communication at its upstream end with the downstream end of a precombustion chamber, said precombustion chamber being in part of circular cross section;
(b) at least one of the upstream and downstream faces of the precombustion chamber being formed with at least four pershaped ceramic pieces, each piece having two adjacent straight edges disposed to form an inner corner, each of said pieces being adapted at its inner corner with a quarter-circle section cut out or removed therefrom so that the piece can be snugly affixed to a cylinder-shaped ceramic, the downstream face pieces being affixed at the inlet of said circular cross section reaction chamber, the upstream face pieces being affixed to a cylinder-shaped ceramic which is adapted to receive the axial make oil injection conduit; two of said four preshaped ceramics making up a precombustion chamber face being substantially of square configuration, and two of said four preshaped pieces being essentially quarter-circle shaped, and disposed in each face in alternate configuration or array;
(c) at least four enclosing pieces of preshaped ceramic enclosing the periphery of said precombustion chamber, said precombustion chamber being formed by at least eight of the recited pieces, said four enclosing pieces being adapted to extend between and to be affixed to the precombustion chamber upstream and downstream faces to



enclose, i.e., to form, the precombustion chamber; at least two of said four enclosing pieces being substantially rectangular shaped to be fittingly affixed to said square-configuration face pieces, and at least two of said four enclosing pieces being curved to be fittingly affixed to the outer curved eadge of each of said quarter-circle shaped pieces;
(d) a tangential entry ceramic piece adapted to be fittingly affixed to and in open communication with said precombustion chamber at the locus of one of said square-configuration pieces of said faces and one of said rectangular-shaped enclosing pieces, said tangential piece being of substantially square cross section and adapted to receive hot combustion gases and to charge said gases into the precombustion chamber substantially in a tangential manner.

4,220,625

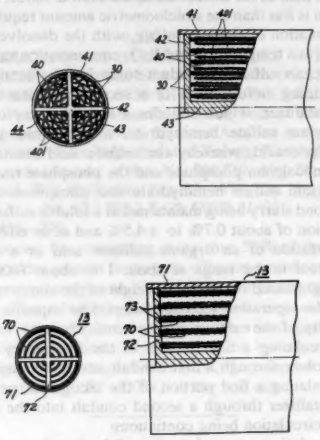
EXHAUST GAS CONTROL EQUIPMENT

Tagao Toh, and Kazuo Iwaoka, both of Toyonaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 843,505, Oct. 18, 1977, abandoned. This application Jun. 5, 1979, Ser. No. 45,775
Claims priority, application Japan, Oct. 20, 1976, 51-126576; Oct. 20, 1976, 51-141775[U]; Dec. 1, 1976, 51-161747[U]
Int. Cl.[2] B01J *35/04, 8/02;* F01N *3/15*
U.S. Cl. 422—180 **11 Claims**

1. An internal combustion engine exhaust gas catalyst unit comprising an exhaust gas casing having an inlet means and an outlet means with a cylindrical catalyst assembly filling the space between said inlet means and said outlet means, said inlet means and said outlet means both disposed in a direction substantially parallel to the direction of exhaust gas flow through the inside space of said casing to define an exhaust gas flow path along the axial direction of said cylindrical catalyst assembly; and
a cylindrical catalyst assembly comprising at least one roll of composite sheet which comprises at least one catalyst-coated sheet of heat resistant glass fiber cloth retained between a pair of heat resistant supporting metal nets, the side edges of both metal nets being secured together by a pair of metal retaining and reinforcing strips inserted therebetween and secured to the edges of the opposing faces of said metal nets, said strips and metal nets retaining and protecting the catalyst-coated sheet against mechanical shock, said catalyst assembly in the form of a roll

defining a cylinder having a plurality of exhaust gas flow paths in the axial direction of said cylindrical catalyst



assembly to provide exhaust gas flow in the direction and along the surface of said composite sheet.

4,220,626

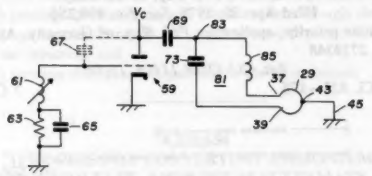
RF INDUCTION HEATING CIRCUITS FOR FLOAT ZONE REFINING OF SEMICONDUCTOR RODS

Robert O. Gregory, St. Louis, and Louis H. Fricke, Jr., Maplewood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 731,869, Oct. 13, 1976, abandoned. This application Apr. 13, 1978, Ser. No. 896,121

Int. Cl.[2] B01J *17/10*

U.S. Cl. 422—250 **13 Claims**



1. Apparatus for zone refining rods of semiconductive material, said apparatus comprising means for positioning a rod of semiconductive material for zone refining, an RF induction work coil for RF induction heating of said rod to produce a molten zone in said rod by inductively coupling RF energy to said rod, said coil having a single turn lying in a plane generally transverse to the lengthwise axis of said rod, said turn encircling said rod, means for causing relative movement between said work coil and said rod to cause said molten zone to pass along the length of said rod, an RF power oscillator circuit including a power amplifying device having a control electrode and a power output electrode, said power output electrode being connected through a voltage-blocking capacitance to an input node of a direct coupled inductive-capacitive tank circuit, said direct coupled tank circuit including said work coil and a capacitance, one input side of said work coil being connected in a circuit to said input node, said capacitance being connected between said input node and the other input side of said work coil, said work coil having a grounded center tap serving as a ground note of said direct coupled tank circuit.

4,220,627

PROCESS FOR THE TREATMENT OF RAW MATERIALS CONTAINING ARSENIC AND METAL

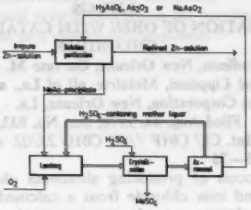
Sigmund P. Fugleberg; Stig-Erik Hultholm; Bror G. Nyman, and Jussi K. Rastas, all of Pori, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Nov. 1, 1978, Ser. No. 956,487

Claims priority, application Finland, Nov. 28, 1977, 773589

Int. Cl.[2] C01G *3/10, 51/10, 53/10*

U.S. Cl. 423—42 **10 Claims**



1. A process for the treatment of raw materials which contain arsenic and metal to produce a metal-free arsenic product and an arsenic-free metal sulfate, comprising leaching the raw material with an aqueous solution of sulfuric acid at elevated temperature under oxidizing conditions; selectively separating an arsenate-bearing aqueous solution; cooling the solution to crystallize the metals as sulfates from the separated aqueous solution; separating the aqueous solution from the metal sulfate crystals; removing arsenic from at least part of the aqueous solution, and finally recycling the solution to the leach.

4,220,628

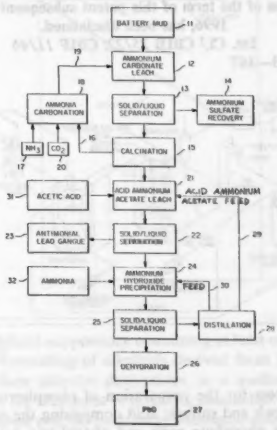
PRODUCTION OF LEAD MONOXIDE FROM LEAD SULFATE WITH ACIDIC AMMONIUM ACETATE

Eugene Striffler, Jr., East Windsor, and Michael A. Kolakowski, Milltown, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 950,075

Int. Cl.[2] C01G *21/02*

U.S. Cl. 423—92 **13 Claims**



1. A process for producing lead monoxide from solid lead sulfate bearing material which comprises:

(a) reacting said material with an ammonium carbonate solution to convert said lead sulfate to lead carbonate;

(b) decomposing the lead carbonate by heating at temperatures from about 400° to 650° C. to decompose substantially all of said lead carbonate to impure lead monoxide;
(c) reacting the impure lead monoxide with an effective amount of acidic ammonium acetate solution to convert said lead monoxide to a lead acetate solution;
(d) reacting the lead acetate solution with ammonium hydroxide to form lead hydroxide; and
(e) dehydrating said lead hydroxide to produce lead monoxide.

4,220,629

CHLORINATION OF ORES WITH CATALYZED METAL CHLORIDES

Ronald Wyndham, New Orleans; Gervase M. Chaplin, Gretna, and Alfred Lippman, Metairie, all of La., assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Aug. 14, 1978, Ser. No. 933,589
Int. Cl.[2] C01F *7/60*; C01G *23/02, 49/10*
U.S. Cl. 423—76 **20 Claims**

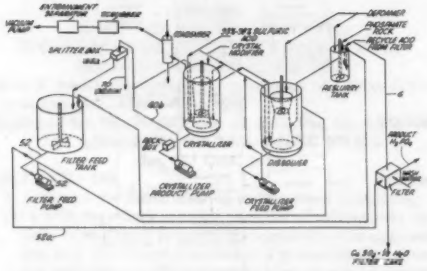
1. A process of producing aluminum chloride, titanium chloride, and iron chloride from a calcined aluminous ore containing aluminum oxide, titanium oxide, and iron oxide comprising subjecting the calcined aluminous ore to a decomposition reaction with silicon tetrachloride at a temperature of from about 500° C. to about 1000° C. in the presence of boron trichloride or a boron compound that will form boron trichloride in the reaction in an amount of from 0.01 to 0.4 on a weight ratio to the silicon tetrachloride wherein a reductant is not used, thereby to produce aluminum chloride, titanium chloride, and iron chloride.

4,220,630

HEMIHYDRATE TYPE PROCESS FOR PHOSPHORIC ACID MANUFACTURE USING ADDITIVE TO IMPROVE FILTERABILITY

Fernando N. Ore', Whittier, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 676,559, Apr. 13, 1976, which is a continuation-in-part of Ser. No. 583,687, Jun. 4, 1975, abandoned, which is a continuation of Ser. No. 301,085, Oct. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 204,670, Dec. 3, 1971, abandoned, and a continuation-in-part of Ser. No. 703,139, Jul. 7, 1976, Pat. No. 4,140,748. This application Jan. 4, 1978, Ser. No. 866,963
The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.
Int. Cl.[2] C01B *25/22*; C01F *11/46*
U.S. Cl. 423—167 **14 Claims**



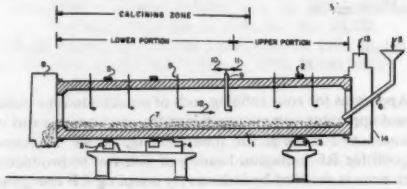
1. A process for the preparation of phosphoric acid from phosphate rock and sulfuric acid comprising the steps of:
(a) adding phosphate rock and phosphoric acid to a first reaction vessel, the dissolver, which contains a first slurry comprising calcium sulphate hemihydrate, monocalcium phosphate, and phosphoric acid, including dissolved calcium, whereby the added phosphate rock is substantially converted to monocalcium phosphate, calcium sulfate hemihydrate, and phosphoric acid while maintaining the first slurry at a soluble or excess sulfate concentration at less than about 0.0%, that is, the soluble sulfate concentration is less than the stoichiometric amount required for the formation of calcium sulfate, with the dissolved calcium, and at a temperature and P_2O_5 concentration such that the calcium sulfate by product comprises the hemihydrate;
(b) adding sulfuric acid to a second reaction vessel, the crystallizer, which contains a second slurry comprising calcium sulfate hemihydrate, monocalcium phosphate, sulfuric acid, whereby the sulfuric acid reacts with the monocalcium phosphate and the phosphate rock to form calcium sulfate hemihydrate and phosphoric acid, said second slurry being maintained at a soluble sulfate concentration of about 0.7% to +4.5% and at an effective concentration of an organic sulfonic acid or a derivative thereof in the range of about 1 to about 1000 ppm by weight based on the total weight of the slurry transferred to the separation section of step(e) to improve the filterability of the calcium sulfate hemihydrate;
(c) circulating a first portion of the first slurry from the dissolver through a first conduit into the crystallizer and circulating a first portion of the second slurry from the crystallizer through a second conduit into the dissolver, the circulation being continuous;
(d) circulating a second portion of the first slurry within the dissolver and circulating a second portion of the second slurry within the crystallizer, and
(e) separating, by filtration, in a separation section a third portion of the second slurry into a liquid comprising phosphoric acid and a solid comprising calcium sulfate hemihydrate.

4,220,631

PROCESS OF CALCINING LIMESTONE OR HYDRATED LIME IN A ROTARY KILN

Harry Serbent, Hanau; Heinz Eichberger, Frankfurt am Main; Hermann Lommert, Neu-Isenburg; Herbert Lausch, Frankfurt am Main, and Horst Steinhöfel, Neu Anspach, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,255
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719348
Int. Cl.[2] C01F *11/04, 11/06*
U.S. Cl. 423—175 **7 Claims**



1. In a process for calcining limestone or hydrated lime by thermal heating of the same with hot gases in an oxidizing atmosphere in a rotary kiln through which the kiln atmosphere and the limestone or hydrated lime charge are countercurrently conducted, which kiln is supplied with fuel through shell burners, the improvement which comprises employing different fuels for producing said hot gases, said fuels releasing different quantities of SO_2 and SO_3 per unit of calorific heat, the fuel which releases the larger quantity of SO_2 or SO_3 per unit of calorific heat being supplied to the upper portion of the rotary kiln, said upper portion being the length portion of said rotary kiln from the charging end of the rotary kiln to the point at which 50 to 90% of the CO_2 content or the water of hydration content of the charge is driven off and the fuel which

releases the smaller quantity of SO_2 and SO_3 per unit of calorific heat being supplied to a lower portion of the rotary kiln.

4,220,632

REDUCTION OF NITROGEN OXIDES WITH CATALYTIC ACID RESISTANT ALUMINOSILICATE MOLECULAR SIEVES AND AMMONIA

Dallas T. Pence, and Thomas R. Thomas, both of Idaho Falls, Id., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 284,810, Aug. 30, 1972, abandoned. This application Sep. 10, 1974, Ser. No. 504,793

Int. Cl.[3] B01J *8/00*; C01B *21/00*

U.S. Cl. 423—239 **8 Claims**

1. A process for converting more than 98% of the noxious nitrogen oxides present in gaseous effluents containing 3 to 20 volume percent oxygen to N_2 and N_2O comprising mixing the gaseous effluent with a gas stream containing an effective amount of ammonia and contacting the mixed gases with a catalyst consisting essentially of a synthetic hydrogen mordenite having pore openings of 3 to 10 A, the temperature of the catalyst bed being 250°–550° C. at the bed exit.

4,220,633

FILTER HOUSE AND METHOD FOR SIMULTANEOUSLY REMOVING NO_x AND PARTICULATE MATTER FROM A GAS STREAM

Edward A. Pirsh, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 30, 1979, Ser. No. 34,518

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 **6 Claims**

1. An improved selective catalytic reduction process for treating NO_x-laden gases containing entrained particulate matter wherein ammonia is added to the gas, the process comprising the following steps:

(a) introducing the ammonia/gas combination into a filter house, the filter house including a plurality of catalytic filter bags,

(b) passing the ammonia/gas combination through the filter bags for simultaneous NO_x reduction and particulate matter removal, and

(c) venting the cleansed gas out of the filter house.

4,220,634

PROCESS FOR CONVERTING AMMONIUM IMIDODISULFATE, AMMONIUM SULFAMATE AND AMMONIUM DITHIONATE TO SULFUR DIOXIDE AND AMMONIA

André Deschamps, Noisy le Roi; Claude Dezael, Maisons Laffitte; Sigismond Franckowiak, Rueil Malmaison, and Henri Gruhier, Chatillon, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Jan. 10, 1979, Ser. No. 2,273

Claims priority, application France, Jan. 10, 1978, 78 00758; Apr. 27, 1978, 78 12882

Int. Cl.[2] C01C *1/02*

U.S. Cl. 423—356 **8 Claims**

1. A process for converting ammonium imidodisulfate and/or ammonium sulfamate to sulfur dioxide and ammonia, wherein the said ammonium salt(s) is (are) contacted with a molten mixture of ammonium bisulfate and ammonium sulfate, at a temperature from 280° to 420° C., in the presence of a sulfur-containing reducing agent and/or a catalyst comprising at least one member of the group consisting of molybdenum, tungsten, copper, iron, cobalt, chromium, manganese and nickel, so as to obtain an effluent gas comprising sulfur dioxide and ammonia.

4,220,635

CATALYTIC METHOD FOR HYDROLYZING UREA

Lorenz P. Schell, Sulphur, La., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 888,440, Mar. 20, 1978. This application May 14, 1979, Ser. No. 39,231

The portion of the term of this patent subsequent to May 2, 1995, has been disclaimed.

Int. Cl.[3] C07C *126/08*; C10L *1/08*

U.S. Cl. 423—358 **10 Claims**

1. In the process of hydrolyzing urea to carbon dioxide and ammonia, the improvement which comprises

carrying out said urea hydrolysis in the presence of a catalytic amount of a vanadium compound.

4,220,636

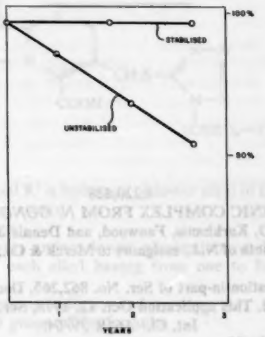
STABILIZED SUPPOSITORIES CONTAINING ERGO-ALKALOIDS

Renate-Else Düscher, Solingen, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft fuer Unwelt-Schutz e. V., Solingen, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,503

Int. Cl.[2] A61J *3/08*; A61K *31/48*

U.S. Cl. 424—14 **3 Claims**



1. A stabilised suppository containing at least one member of the group consisting of alkaloids derived from Secale cornutum and their dihydro derivatives, in a medically effective amount for the treatment of migraine headaches, characterised in that at least one SO_2-releasing substance selected from the group consisting of alkali, alkaline earth and magnesium salts of sulphurous acid and pyrosulphuric acid and the addition products of said salts with aldehydes and ketones is added in a finely dispersed state to the suppository in an amount of 0.2 to 5 mg per suppository.

4,220,637

WATER SOLUBLE AGENTS EFFECTIVE AS IMMUNOLOGICAL ADJUVANTS FOR STIMULATING IN THE HOST THE IMMUNE RESPONSE TO VARIOUS ANTIGENS AND COMPOSITIONS, NOTABLY VACCINES CONTAINING SAID WATER SOLUBLE AGENTS

Francoise Audibert, Neuilly-sur-Seine; Louis Chedid; Jean Choay, both of Paris; Edgar Lederer, Sceaux, and Pierre Lefrancier, Bures sur Yvette, all of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine-Cedex, France

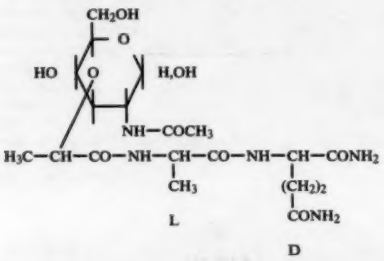
Continuation-in-part of Ser. No. 519,991, Oct. 22, 1974. This application Jul. 15, 1977, Ser. No. 815,811

Claims priority, application France, Jul. 16, 1976, 76 21889

Int. Cl.[2] A61K *39/00;* C07C *103/52;* A61K *37/00*

U.S. Cl. 424—88 20 Claims

1. The diamide of the 2-(2-acetamido-2-deoxy-3-O-D-glucopyranosyl)-D-propionyl-L-alanyl-D-glutamic acid of the following formula (I):



(I)

4,220,638

ANTIGENIC COMPLEX FROM *N. GONORRHOEAE*

Yashwant D. Karkhanis, Fanwood, and Dennis J. Carlo, South Amboy, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 862,265, Dec. 20, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 949,581

Int. Cl.[2] A61K *39/04*

U.S. Cl. 424—92 5 Claims

1. An antigenic, immunogenic, complex obtained from the cell surface of *N. gonorrhoeae* which is protective against *N. gonorrhoeae* having a molecular weight of from about 9,200,000 to about 9,500,000, over 80% of the complex being formed of five subunits in approximately equal amount having molecular weight of about 68,000, about 50,000, about 34,000, about 27,000 and about 10,500, the complex containing on a dry weight basis from about 90 to about 95% protein, up to about 7% lipopolysaccharide, about 2% carbohydrate and less than 1% of RNA, DNA and phospholipids.

4,220,639

ANTIBIOTICS SF-2050 AND SF-2050B SUBSTANCES AND PRODUCTION AND USE THEREOF

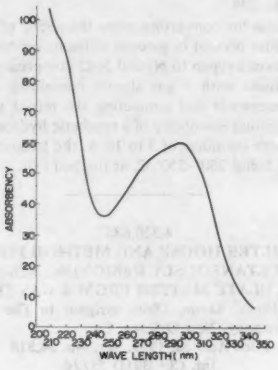
Kazunori Ohba; Chuhei Nojiri; Yasuaki Ogawa; Jiro Itoh, all of Yokohama; Kunikazu Totsugawa, Tokyo; Norio Ezaki, Yokohama; Takashi Shomura, Yokohama; Tomizo Niwa, Yokohama; Shigeharu Inouye, Yokohama, and Yujiro Yamada, Yokahama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jan. 26, 1979, Ser. No. 6,873

Claims priority, application Japan, Feb. 14, 1978, 53-15026; Mar. 14, 1978, 53-28324

Int. Cl.[2] C12D *9/14;* A61K *35/00*

U.S. Cl. 424—117 8 Claims



1. A process for the production of SF-2050 substance and/or SF-2050B substance, which comprises:

cultivating a strain of the genus Streptomyces capable of producing SF-2050 substance and SF-2050B substance in an aqueous liquid culture medium containing assimilable carbon and nitrogen sources under aerobic conditions for a period of time sufficient to produce and accumulate at least one of SF-2050 substance and SF-2050B substance in the culture, and

then recovering at least one of the SF-2050 substance and SF-2050B substance from the culture.

4,220,640

STABILIZATION OF RESMETHRIN

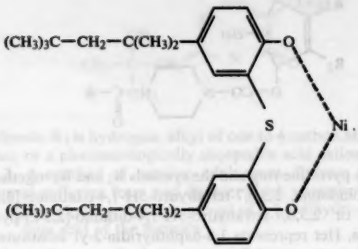
Arnold Zweig, Westport, and Arthur K. Hoffman, New Canaan, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 470,763, May 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,366, Oct. 4, 1973, abandoned. This application May 13, 1976, Ser. No. 685,944

Int. Cl.[2] A01N *00/00, 9/28, 9/00*

U.S. Cl. 424—175 2 Claims

2. A stabilized resmethrin composition and a stabilizer in an amount to effect stabilization of the formula:



4,220,641

ORGANIC COMPOUNDS

Rene P. Traber; Max Kuhn, both of Basel; Hans Hofmann, Ettingen, and Eugen Häri, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 4, 1978, Ser. No. 902,794

Claims priority, application Switzerland, May 10, 1977, 5822/77; May 10, 1977, 5823/77; Jun. 17, 1977, 7457/77

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 10 Claims

1. A compound closen from cyclosporin D, dihydrocyclosporin D or isocyclosporin D.

4,220,642

VASOACTIVE LUNG POLYPEPTIDES

Sami I. Said, 5323 Henry Hines Blvd., Dallas, Tex. 75235, and Viktor Mutt, Karolinska Institutet, Stockholm, Sweden

Continuation of Ser. No. 649,968, Jan. 19, 1976, Pat. No. 4,113,711. This application Sep. 7, 1978, Ser. No. 940,362

The portion of the term of this patent subsequent to Sep. 12, 1995, has been disclaimed.

Int. Cl.[2] A61K *37/00;* C07G *7/00*

U.S. Cl. 424—177 6 Claims

1. A method for the extraction and isolation of vasoactive peptides from the lungs of animals, one of said peptides being the fraction of hatched area B of FIG. 2, and the other of said peptides being the fraction of hatched area A of FIG. 2 and exhibiting the property of relaxing isolated non-vascular, smooth muscle organs, said method comprising the steps of collecting, boiling and mincing lung portions, extracting the resulting lung portions with acetic acid at a temperature of about 0°–5° C., filtering the resulting extract, and subjecting the extract to alginic acid absorption by the steps comprising lowering the pH with HCl acid and stirring with alginic acid, allowing the alginic acid mixture to settle and discarding supernatant liquid, recovering the resulting sediment, washing with dilute HCl and eluting from the alginic acid with HCl, adding sodium chloride to the eluate and collecting a salt precipitate, dissolving the salt precipitate in water, neutralizing the resulting solution to a pH of about 7, heating the solution with vigorous stirring and then extracting it with an alcohol, acidifying with mineral acid and collecting an alcoholic extract material, subjecting the alcoholic extract material to gel chromatography over a cross-linked dextran at least one time while dissolved in an organic acid, collecting fractions from the beginning of introduction of the extract into the chromatographic column, combining the recovered fractions, saturating with sodium chloride and salting out the product, collecting the fractions from the gel chromatography in two parts, testing for the most active fractions by tests of femoral blood flow on anesthetized dogs and on isolated smooth muscle organs, subjecting the active fractions to at least one ion-exchange chromatography over carboxymethyl cellulose while dissolved in a buffer solution at a pH of 6–7, centrifuging to eliminate insoluble materials, collecting separate fractions and treating with alginic acid for absorption of peptides and eluting with mineral acid, freeze drying and lyophilizing the resulting fractions, and identifying the separate active fractions by characterization for effect on blood flow and smooth muscle organs; said active fractions being said fraction of hatched area B and said fraction of hatched area A.

4,220,643

NITROSOUREA PENTOSE COMPOUNDS

Tetsuo Suami, 5-8, Nakamachi 3-chome, Musashino-shi, Tokyo, Japan

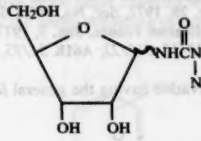
Filed Oct. 16, 1978, Ser. No. 951,456

Claims priority, application Japan, Oct. 27, 1977, 52/128086

Int. Cl.[2] A61K *31/70;* C07H *5/06*

U.S. Cl. 424—180 4 Claims

1. A nitrosourea compound of the formula:



wherein ~ represents a single bond which may be in either the α- or β-position.

4. A pharmaceutical composition comprising an effective amount of a nitrosourea compound as defined in claim 1 in association with a pharmaceutically acceptable excipient, carrier or diluent.

4,220,644

7-ACYLAMINO-3-(SUBSTITUTED TETRAZOLYL THIOMETHYL) CEPHALOSPORINS

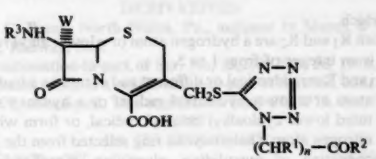
David A. Berges, Wayne, Pa., assignor to SMITHKLINE, Smithkline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 536,760, Dec. 27, 1974. This application May 3, 1976, Ser. No. 682,805

Int. Cl.[2] A61K *31/545;* C07D *501/36*

U.S. Cl. 424—246 21 Claims

1. A compound of the formula:



in which:

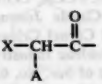
each individual R^1 is hydrogen or lower alkyl of from one to four carbon atoms;

n is one to ten;

R^2 is hydroxy, amino, lower alkylamino or di(lower)alkylamino, each alkyl having from one to four carbon atoms;

W is hydrogen or methoxy; and

R^3 is an acyl group of the formula:



where:

X is thienyl; dihydrophenyl; phenyl; phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido or carboxymethylamino; or 3-fluoro-4-hydroxyphenyl; and

A is NH_2, OH, COOH or SO_3H provided that A is not NH_2 or OH when R^2 is hydroxy,

or a non-toxic pharmaceutically acceptable salt thereof.

17. A pharmaceutical composition having antibacterial activity comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

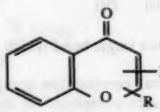
19. A method of treating bacterial infections comprising administering internally either orally or by injection to an infected or susceptible warm-blooded animal an antibacterially effective but nontoxic dose of a compound as claimed in claim 1.

4,220,645
CHROMONE DERIVATIVES

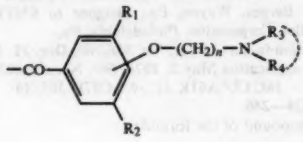
Henri Chibret, Clermont-Ferrand, France, assignor to Thea (Therapeutique et Applications) SA, France

Filed Dec. 29, 1977, Ser. No. 865,573
Claims priority, application France, Jan. 3, 1977, 77 00010
Int. Cl.[2] C07D *413/12, 311/22;* A61K *31/35, 31/535*
U.S. Cl. 424—248.58 **16 Claims**

1. A chromone derivative having the general formula:



in which one of the radicals R and R′ is in the 2 position on the chromone ring and the other of the radicals R and R′ is in the 3 position, R′ is a hydrogen atom or a lower alkyl radical, and R is the group:



in which

both R_1 and R_2 are a hydrogen atom or a lower alkyl radical,

n is an integer of from 1 to 5,

R_3 and R_4 are identical or different and comprise a hydrogen atom or a lower cycloalkyl radical or a hydroxy substituted lower cycloalkyl or alkyl radical, or form with the nitrogen atom a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, morpholine and N-hydroxy ethyl piperazine.

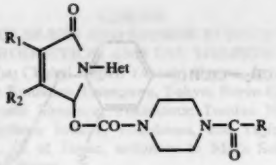
13. A pharmaceutical composition useful in treating arrhythmia, bradycardia, tachycardia, and heart disorders necessitating sympathico inhibition comprising an effective amount of a derivative of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,220,646
HETEROCYCLIC COMPOUNDS

Claude Cotrel, Paris; Claude Jeanmart, Brunoy; Mayer N. Messer, Bievres, and Cornel Crisan, Sceaux, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 628,926, Nov. 5, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,801
Claims priority, application France, Nov. 7, 1974, 7436963; Sep. 4, 1975, 7527160; 7527161; 7527162.
Int. Cl.[2] A61K *31/385, 31/495;* C07D *209/048*
U.S. Cl. 424—250 **13 Claims**

1. A heterocyclic compound of the formula:



wherein the pyrroline ring and the symbols R_1 and R_2 together form an isoindoline, 2,3,6,7-tetrahydro-5H-1,4-oxathiino-[2,3-c]-pyrrole, or 2,3,6,7-tetrahydro-5H-1,4-dithiino-[2,3-c]-pyrrole nucleus, Het represents 1,8-naphthyridin-2-yl substituted by a chlorine atom, and R represents hydrogen, alkyl of 1 through 4 carbon atoms, alkenyl of 2 through 4 carbon atoms or trifluoromethyl.

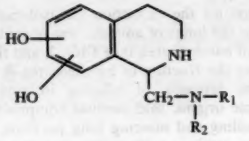
2. A pharmaceutical composition useful as a tranquilliser, anti-convulsant agent, decontracturant or hypnotic agent which comprises, as active ingredient, an effective amount of a heterocyclic compound of the formula depicted in claim 1 wherein R_1, R_2, Het, and R have the meanings specified in claim 1 in association with a pharmaceutical carrier.

4,220,647
1,2,3,4-TETRAHYDROISOQUINOLINES AND THE PREPARATION THEREOF

Teiji Kishimoto, Kawanishi; Hiromu Kochi, Sakai, and Masayuki Kato, Ikeda, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Filed Nov. 5, 1975, Ser. No. 628,935
Claims priority, application Japan, Nov. 6, 1974, 49-128479; Nov. 15, 1974, 49-132287; Dec. 12, 1974, 49-143293
Int. Cl.[2] C07D *217/14;* A61K *31/47*
U.S. Cl. 424—258 **21 Claims**

1. A 1,2,3,4-tetrahydroisoquinoline of the formula:



wherein R_1 and R_2 are each hydrogen, phenyl or naphthyl wherein said phenyl and naphthyl groups may be substituted with 1 to 3 substituent(s) selected from the the group consisting of halogen and hydroxy and wherein the two hydroxy groups on the carbocyclic ring of the tetrahydroisoquinoline ring are in the 6,7 or 7,8 positions, and pharmaceutically acceptable salts thereof.

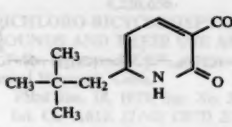
21. A method of relaxing smooth muscles in mammals which comprises administering an amount of a compound of claim 1 sufficient for effectively relaxing said smooth muscles.

4,220,648
ANTIDIABETIC 1,2-DIHYDRO-2-OXO-6-NEOPENTYL-NICOTINIC ACIDS

Gilbert A. Youngdale, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 22, 1979, Ser. No. 5,454
Int. Cl.[2] C07D *213/55;* A61K *31/44*
U.S. Cl. 424—266 **6 Claims**

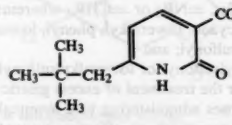
1. A 1,2-dihydro-2-oxonicotinic acid derivative of the formula



wherein R_1 is hydrogen, alkyl of one to 4 carbon atoms, inclusive, or a pharmacologically acceptable acid cation.

3. A method of treating adult-onset diabetes mellitus in human suffering from said disease which comprises:

orally administering an amount of a 1,2-dihydro-2-oxonicotinic acid of the formula



wherein R_1 is as defined in claim 1, effective to exert a predetermined systemic antihyperglycemic effect.

4,220,649

1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER DERIVATIVES

Tadao Kojima, Saitama, and Toichi Takenaka, Tokyo, both of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

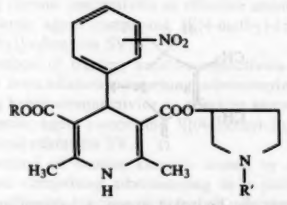
Filed Jan. 31, 1979, Ser. No. 8,085

Claims priority, application Japan, Feb. 14, 1978, 53-15673

Int. Cl.[2] C07D *213/55*; A61K *31/44*

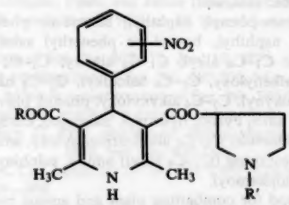
U.S. Cl. 424—266 **8 Claims**

1. 1,4-Dihydropyridine-3,5-dicarboxylic acid ester derivatives represented by the formula



wherein R represents a lower alkyl group and R′ represents a hydrogen atom, a lower alkyl group, or benzyl phenylethyl, and the therapeutically non-toxic salts thereof.

4. An antihypertensive composition comprising a mixture of a 1,4-Dihydropyridine-3,5-dicarboxylic acid ester derivative represented by the formula



wherein R represents a lower alkyl group and R′ represents a hydrogen atom, a lower alkyl group, benzyl or phenylethyl, or a therapeutically non-toxic salt thereof as the active ingredient, and a therapeutically acceptable carrier therefor.

4,220,650

ORGANIC DIAMINE THERAPEUTIC COMPOSITIONS AND METHODS

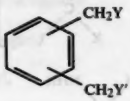
John L. Belletire, Madison, Wis., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 18, 1978, Ser. No. 952,302

Int. Cl.[2] A61K *31/445*; C07D *401/10*

U.S. Cl. 424—267 **5 Claims**

4. A method for lowering blood sugar in the treatment of a diabetic host, which comprises orally administering to said host an effective blood sugar lowering amount of a compound selected from the group consisting of organic diamine bases of the formula:



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein

Y and Y′ are each a member selected from the group consisting of pyrrolidino, piperidino, homopiperidino, morpholino and thiomorpholino.

5. The method as claimed in claim 4 wherein the compound administered is 1,1′-[1,2-phenylenebis(methylene)]bispiperidine.

4,220,651

ANTIPSYCHOTIC LEVOROTATORY ENANTIOMERS OF 3-HALOCYPROHEPTADINES, ANALOGS AND DERIVATIVES

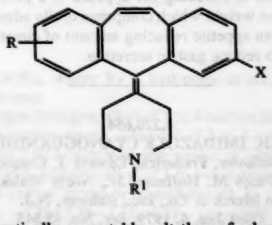
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 15,253, Feb. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 323, Jan. 2, 1979, abandoned. This application May 21, 1979, Ser. No. 40,819

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

1. A method of treating psychoses which comprises the administration to a patient in need of such treatment an effective antipsychotic amount of a racemic or levorotatory compound of formula:



or pharmaceutically acceptable salt thereof wherein R is hydrogen, fluoro, or lower alkyl; R^1 is methyl or cyclopropylmethyl; and X is chloro, bromo, or iodo.

4,220,652

ISOTHIAZOLYL ALKYLAMINOETHYLENE COMPOUNDS

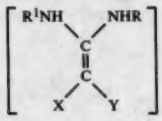
Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote; Charon R. Ganellin, Welwyn Garden City, and Hunter D. Prain, Welwyn, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

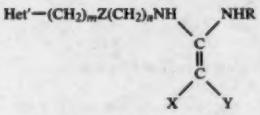
Division of Ser. No. 797,160, May 16, 1977, Pat. No. 4,124,717, which is a division of Ser. No. 629,174, Nov. 5, 1975, Pat. No. 4,046,907, which is a continuation-in-part of Ser. No. 468,617, May 9, 1974, Pat. No. 3,953,460. This application Aug. 1, 1978, Ser. No. 930,102

Int. Cl.[2] A61K *31/425;* **C07D** *417/12*

U.S. Cl. 424—270 **7 Claims**

1. A compound of the formula:





wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; Het' is isothiazole unsubstituted or substituted by lower alkyl, hydroxyl, halogen or amino; R is hydrogen, lower alkyl or Het-$(CH_2)_m$Z$(CH_2)_n$; Z is sulphur or methylene; m is 0, 1 or 2 and n is 2 or 3 provided that the sum of m and n is 3 or 4; Het is an oxazole, isoxazole, triazole, isothiazole or thiadiazole ring unsubstituted or substituted by lower alkyl, hydroxyl, halogen or amino; and Ar is phenyl unsubstituted or substituted by halogen or methyl or a pharmaceutically acceptable acid addition salt thereof.

7. A method of inhibiting H-2 histamine receptors which comprises administering to an animal in need thereof in an effective amount to inhibit said receptors a compound of claim 1.

4,220,653

ADMINISTRATION OF CIMETIDINE TO REDUCE APPETITE AND FACILITATE WEIGHT LOSS IN PERSONS SUFFERING FROM EXCESSIVE WEIGHT

A. Earl Vivino, Rte. 2, Box 455, Frederick, Md. 21701

Filed Jan. 24, 1979, Ser. No. 6,171

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 R **5 Claims**

1. A method of reducing the appetite of a person suffering from excessive weight which comprises orally administering to said persons an appetite reducing amount of cimetidine which is effective to reduce gastric secretion.

4,220,654

CYCLIC IMIDAZOLE CYANOGUANIDINES

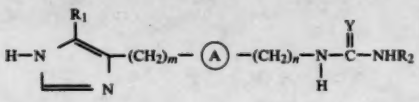
William A. Bolhofer, Frederick; Edward J. Cragoe, Jr., Lansdale, and Jacob M. Hoffman, Jr., North Wales, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 4, 1979, Ser. No. 45,545

Int. Cl.[2] C07D *233/64;* **A61U** *31/45*

U.S. Cl. 424—273 R **12 Claims**

1. A compound having the formula:



wherein

R_1 is hydrogen or methyl;

R_2 is loweralkyl;

m and n are independently 0 to 3;

(A) is a cyclic bivalent radical selected from phenylene, cyclohexylene, thienylene, tetrahydrothienylene, and 1,3-dithianylene, which may optionally be substituted with a halogen, and

Y is oxygen, sulfur, $=NR_3$ or $=CHR_4$ wherein:

R_3 is hydrogen, cyano, loweralkyl, phenyl, loweralkylsulfonyl or phenylsulfonyl; and

R_4 is nitro, phenylsulfonyl or loweralkylsulfonyl.

11. A method for the treatment of excess gastric acid secretions which comprises administering to a mammal with such excess gastric acid secretions, an effective amount of a compound of claim 1.

4,220,655

PESTICIDAL 5-OXO-2,5 DIHYDROPYRROLE

Beat Böhner, Binningen, and Marcus Baumann, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

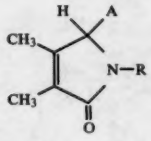
Division of Ser. No. 822,497, Aug. 8, 1977, Pat. No. 4,138,243. This application Nov. 20, 1978, Ser. No. 962,843

Claims priority, application Switzerland, Aug. 12, 1976, 10309/76

Int. Cl.[2] A01N *9/22;* **C07D** *207/24*

U.S. Cl. 424—274 **5 Claims**

1. A 3,4-dimethyl-2-hydroxy-5-oxo-2,5-dihydropyrrole compound of the formula I



(I)

wherein

A represents the hydroxyl group, a halogen atom or an O-acyl radical, wherein said acyl portion is derived from (C_1–C_{12} alkyl) carboxylic acid, (C_1–C_{12} alkyl) carboxylic acid substituted by halogen or having the alkyl group interrupted by oxygen or a -CO- group, (C_2–C_{12} alkenyl) carboxylic acid, (C_3–C_6 cycloalkyl) carboxylic acid, (C_1–C_4 alkoxy-) or (C_1–C_4 alkylthio-) carboxylic acid, mono- or di-substituted (C_1–C_4 alkyl) carbamoyloxy acid, or benzoic acid; and

R represents phenyl, naphthyl, benzyl or phenethyl, or phenyl, naphthyl, benzyl or phenethyl substituted by halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_2–C_4 alkenyloxy, C_1–C_4 haloalkyl, C_2–C_4 haloalkenyl, C_3–C_4 alkynyl, C_3–C_4 alkynyloxy, phenyl, phenoxy, benzyloxy, nitro, cyano, hydroxyl, mercapto, carboxyl, benzoyl, acetamido, C_1–C_4 alkylcarbamoyloxy, amino mono- or di-substituted (C_1–C_4 alkyl) amino, sulphinyl, sulphonyl or sulphamoyl.

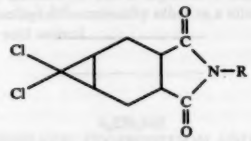
5. A method for combatting plant and animal pests which comprises applying to the locus thereof a pesticidally effective amount of a 3,4-dimethyl-2-hydroxy-5-oxo-2,5-dihydro-pyrrole compound of the formula I, claim 1.

4,220,656
7,7-DICHLORO-BICYCLOHEPTANE IMIDE COMPOUNDS AND THEIR USE AS BIOCIDES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 15, 1979, Ser. No. 3,572
Int. Cl.[2] A61K *31/40;* C07D *209/48*
U.S. Cl. 424—274 9 Claims

6. A method of controlling fungi comprising applying to the fungi or the locus thereof a fungicidally effective amount of a compound having the formula



in which R is thio(halo-lower alkyl).

4,220,657
METHOD FOR TREATMENT OF HUMAN EYE DISEASE

Lewis A. Johnson, 1050 Park Ave., New York, N.Y. 10028, and Emil Wirostko, E. 208 Midland Ave., Paramus, N.J. 07652

Division of Ser. No. 435,643, Jan. 23, 1974, abandoned. This application Aug. 11, 1978, Ser. No. 932,904
Int. Cl.[2] A61K *31/34;* C12K *1/00*
U.S. Cl. 424—285 20 Claims

1. A method of treating active endogenous uveitis caused by *Micromyces intracellularis* comprising administering to a patient having endogenous uveitis an effective amount therefor of a therapeutic agent comprising 3 [[(4-methyl-1-piperazinyl-)imino]methyl]-rifamycin SV.

6. A method of treating chronic conjunctivitis caused by *Micromyces intracellularis* comprising administering to a patient having chronic conjuntivitis an effective amount therefor of a therapeutic agent comprising 3[[(4-methyl-1piperazinyl-)imino]methyl]-rifamycin SV.

11. A method of treating kerato-conjunctivitis caused by *Micromyces intracellularis* comprising administering to a patient having kerato-conjunctivitis an effective amount therefor of a therapeutic agent comprising 3[[(4-methyl-1-piperazinyl-)imino]methyl]-rifamycin SV.

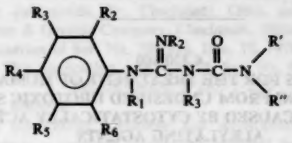
16. A method of treating keratitis caused by *Micromyces intracellularis* comprising administering to a patient having keratitis an effective amount therefor of a therapeutic agent comprising 3[[(4-methyl-1-piperazinyl)imino]methyl]-rifamycin SV.

4,220,658
TREATMENT OF HYPERTENSION WITH AMIDINOUREAS

George H. Douglas, Paoli, and Julius Diamond, Lafayette Hill, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 805,371, Jun. 10, 1977, abandoned, which is a continuation of Ser. No. 687,266, May 17, 1976, abandoned, which is a continuation of Ser. No. 385,797, Aug. 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,474, Sep. 22, 1977, abandoned. This application Jul. 17, 1978, Ser. No. 925,145
Int. Cl.[2] A61K *31/17, 31/275;* C07C *127/00*
U.S. Cl. 424—304 9 Claims

1. A method for treating hypertension comprising administering to a patient suffering from said hypertension a therapeutically effective amount therefor between 0.5 mg and 500 mg per dosage unit of at least one compound of the formula:



II.

where:

R_2, R_3, R_4, R_5 and R_6 may be the same or different and are hydrogen, halo, haloloweralkyl, nitro, cyano, loweralkylsulfonyl, loweralkoxy or loweralkyl;

R_1, R_2 and R_3 are hydrogen or loweralkyl;

R′ and R″ are hydrogen, loweralkyl, intermediate alkyl, loweralkenyl, cycloalkyl, cycloalkylloweralkyl, aralkyl, cycloalkenyl or aryl;

R′ and R″ together are loweralkylidenyl;

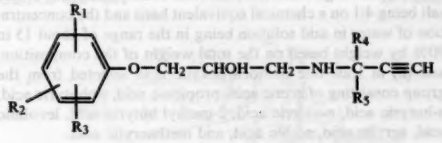
provided R_1, R_2, R_3, R′ and R″ are not all hydrogen at the same time; and the non-toxic acid addition salts thereof.

4,220,659
1-PHENOXY-2-HYDROXY-3-ALKYNYLAMINO-PROPANES AND SALTS THEREOF

Herbert Koppe; Werner Kummer; Helmut Stühle, and Gojko Muacevic, all of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 742,782, Nov. 18, 1976, Pat. No. 4,119,728, which is a continuation-in-part of Ser. No. 609,998, Sep. 3, 1975, Pat. No. 4,016,202, which is a continuation-in-part of Ser. No. 444,713, Feb. 22, 1974, Pat. No. 3,925,446. This application Jul. 14, 1978, Ser. No. 924,791
Int. Cl.[2] C07C *101/42;* A01N *9/20*
U.S. Cl. 424—309 6 Claims

1. A racemic or optically active compound of the formula



wherein

R_1 is —$COOR_6$, where R_6 is hydrogen or alkyl of 1 to 4 carbon atoms;

R_2 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkanoyl of 2 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms; amino or nitro;

R_3 is hydrogen, halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or, together with R_2 in the ortho-position, —CH=CH—CH=CH— or —$(CH_2)_n$—, where n is an integer from 3 to 5;

R_4 is hydrogen or alkyl of 1 to 3 carbon atoms; and

R_5 is alkyl of 1 to 3 carbon atoms or, together with R_4, $(CH_2)_p$—, where p is an integer from 4 to 6;

or a physiologically compatible acid addition salt thereof.

4,220,660

PROCESS FOR THE TREATMENT OF HUMANS SUFFERING FROM UNDESIRED UROTOXIC SIDE EFFECTS CAUSED BY CYTOSTATICALLY ACTIVE ALKYLATING AGENTS

Norbert Brock, Bielefeld, Fed. Rep. of Germany, assignor to Asta-Werke Aktiengesellschaft, Chemische Fabrik, Bielefeld, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 967,000
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1977, 2756018; Jun. 23, 1978, 2827625
Int. Cl.[2] A61K *31/185*
U.S. Cl. 424—315 7 Claims

1. Process for the treatment of humans suffering from the undesired urotoxic side effects caused by cytostatically active alkylating agents selected from the group consisting of cyclophosphamide, trofosfamide, ifosfamide, and sufosfamide in the kidneys, urinary tracts and urinary bladder comprising administering a pharmacologically acceptable salt of a mercapto alkane sulfonic acid having the general formula

$$HS—alk—SO_3H,$$

wherein alk is a member selected from the group consisting of the straight and branched alkylene groups having from 2 to 6 carbon atoms, to the human treated with the alkylating agent in an amount ranging from 20% to about 100% of the weight of the dose of the alkylating agent of the salt of the mercapto alkane sulfonic acid.

4,220,661

PRESERVATIVE COMPOSITION

John J. Huitson, Banstead, England, assignor to BP Chemicals Limited, London, England

Continuation-in-part of Ser. No. 735,200, Oct. 26, 1976, abandoned. This application May 15, 1978, Ser. No. 905,735
Claims priority, application United Kingdom, Nov. 27, 1975, 38357/76
The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—317 6 Claims

1. A liquid preservative composition comprising: (a) an aqueous solution of a salt of formic acid and a cation selected from the group consisting of ammonium, sodium, potassium, calcium and magnesium ions, the ratio of acid to cations in said salt being 4:1 on a chemical equivalent basis and the concentration of water in said solution being in the range of about 15 to 90% by weight based on the total weight of the composition, and (b) at least one monocarboxylic acid selected from the group consisting of acetic acid, propionic acid, isobutyric acid, n-butyric acid, n-valeric acid, 2-methyl butyric acid, levulinic acid, acrylic acid, sorbic acid, and methacrylic acid.

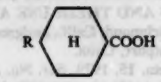
4,220,662

GUANIDINOCYCLOHEXANECARBOXYLIC ACIDS

Elton S. Cook, 1842 Madison Rd., Cincinnati, Ohio 45206, and Akira Fujii, 870-1 Sakaecho, Nishi-2, Matsudo, Japan

Filed Jul. 24, 1978, Ser. No. 927,058
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 3 Claims

1. A method of treating bacterial infections in mammals comprising administering to a mammal suffering from said bacterial infection an antibacterially effective amount of the compound



wherein the R substituent is selected from the group consisting of $—NHC(NH)NH_2$, and $—CH_2NHC(NH)NH_2$.

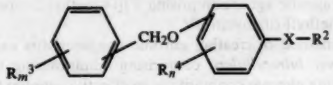
4,220,663

COMBATING PESTS WITH BENZYL PHENYL ETHERS

Andreas Schulze, Cologne; Klaus Sasse, Berg. Gladbach; Klaus Naumann, Cologne; Peter Roessler, Berg. Gladbach, and Peter Kraus, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Atkiengesellschaft, Leverkusen, Fed. Rep. of Germany

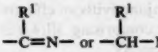
Division of Ser. No. 809,492, Jun. 23, 1977, Pat. No. 4,145,439. This application Jul. 20, 1978, Ser. No. 926,586
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1976, 2631948
Int. Cl.[2] A01N *9/20, 9/24;* C07C *93/06*
U.S. Cl. 424—330 13 Claims

1. A substituted benzyl phenyl ether of the formula



in which

X is



R^1 is H or methyl,

R^2 is alkyl or alkylidene with 4–18 carbon atoms, alkenyl or alkenylidene with 3–8 carbon atoms, or alkynyl or alkynylidene with 3–8 carbon atoms, any of which is optionally substituted by alkoxy with 1–6 carbon atoms, OH, amino or monoalkylamino or dialkylamino with 1–6 carbon atoms in each alkyl moiety, or by an alkylene bridge with 5 carbon atoms, or, may be optionally substituted alkyl with 1–3 carbon atoms;

R^3 each independently is alkyl with 1–4 carbon atoms, alkoxy with 1–4 carbon atoms, halogen, trifluoromethyl, trichloromethyl, trifluoromethoxy, trifluoromethylmercapto or nitro,

R^4 each independently is H, halogen or alkoxy with 1 to 4 carbon atoms,

m is an integer from 1 to 5, and

n is an integer from 1 to 4,

or an acid addition salt thereof.

9. An arthropodicidal, nematicidal, fungicidal or bactericidal composition containing as active ingredient an arthropodicidally nematicidally, fungicidally or bactericidally effective amount of a substituted benzyl phenyl ether according to claim 1, or an acid addition salt thereof, in admixture with a diluent.

4,220,664

DEUTERATED ISOFLURANE AS AN ANESTHETIC AGENT

Leslie P. McCarty, and Eric R. Larsen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1979, Ser. No. 7,075
The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.
Int. Cl.[2] A61K *31/08*
U.S. Cl. 424—342 5 Claims

1. A method for anesthetizing an inhalation anesthetic susceptible animal which comprises administering an effective anesthetizing amount of the compound 1-chloro-1-deutero-2,2,2-trifluoroethyl difluoromethy ether as a inhalation general anesthetic to said animal.

4,220,665

BACTERIOSTATIC COMPOSITION AND METHOD

Erich Klein, Holzminden, Fed. Rep. of Germany, assignor to Dragoco Gerberding & Co GmbH, Holzminder, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,723
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1977, 2728921
Int. Cl.[3] A01N *31/00;* A61K *31/045*
U.S. Cl. 424—343 5 Claims

1. A method of combatting growth of Gram-positive skin bacterial flora, comprising the step of applying to Gram-positive bacteria on a skin surface a bacteriostatically effective amount of 3,7,11-trimethyl-dodeca-2,6,10-trien-1-ol.

4,220,666

SUCROSE-INVERT SUGAR PROTEIN PRODUCT AND METHOD OF MANUFACTURE

Murray E. Fields, Tempe, Ariz., assignor to Desert Merchandising, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 729,832, Oct. 4, 1976, abandoned, and a continuation-in-part of Ser. No. 841,944, Oct. 13, 1977, abandoned. This application Feb. 3, 1978, Ser. No. 874,949
Int. Cl.[2] A23J *3/00;* A23L *1/09*
U.S. Cl. 426—62 9 Claims

1. The method of preparing a nutrition product, which method comprises the steps of:

mixing first ingredients comprising approximately 450. milligrams of brown sugar with 300. milligrams of soya protein and 250. milligrams of invert sugar,

blending said first ingredients until they pass through a 12 to 14 mesh screen,

wetting said first ingredients to form a wet granulated material,

drying said wet granulated material to form a dry granulated material,

mixing second ingredients comprising approximately 3.75 milligrams of calcium d-pantothenate, approximately 7.50 milligrams of niacin, approximately 7.50 milligrams of niacinamide, approximately 1.50 milligrams of thiamine mononitrate, approximately 2.00 milligrams of riboflavin, and approximately 0.75 milligrams of pyridoxine,

blending said second ingredients until they pass through a 12 to 14 mesh screen,

mixing said dried first granulated material, said blended second ingredients and a third ingredient comprising approximately 100. milligrams of yeast and milling and screening said milled material through a 12 to 14 mesh screen, and

forming said last mixture into tablet or wafer form.

4,220,667

ZINC CONTAINING CONDIMENTS

William Jakinovich, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 750,926, Dec. 15, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,073
Int. Cl.[2] A23L *1/237, 1/226*
U.S. Cl. 426—96 32 Claims

1. A non-caking, palatable and nutritional composition, comprising: a granular condiment selected from the group consisting of sodium chloride, mixtures of sodium chloride and potassium chloride, and sugar, the individual particles of said condiment being substantially coated with an amount of a saliva-insoluble, physiologically acceptable zinc salt selected from the group consisting of zinc oxide, zinc carbonate, and zinc phosphate, and mixtures thereof, in the form of a finely divided powder sufficient to prevent caking of said granular condiment, to supplement dietary zinc levels and to alleviate dietary deficiencies of zinc.

4,220,668

METHOD FOR PREPARING SAUSAGE MEATS

Hugo E. Wistreich, Chicago, Ill., and Dennis G. Olson, Lincoln, Nebr., assignors to B. Heller & Company, Bedford Park, Ill.

Continuation-in-part of Ser. No. 806,956, Jun. 15, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,221
Int. Cl.[2] A22C *11/00*
U.S. Cl. 426—266 9 Claims

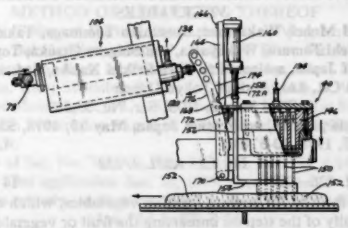
1. A method of preparing a non-fermented sausage, comprising the steps of mixing sausage ingredients including sausage meats, treating the mixture by immersion in an aqueous bath having a titratable acidity within the range of 1–20% for a time sufficient to completely penetrate and coagulate meats of said sausage ingredients and to lower the pH of the meat to below 5.2 throughout its cross section, in which at least 20% of the acidity is in the form of lactic acid while any remainder is selected from the group of edible organic acids selected from the group consisting of acetic, citric, benzoic, sorbic malic and caproic, and then cooking the treated sausage meat.

4,220,669

METHOD AND MEANS FOR INJECTING FLUIDS INTO MEAT PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 789,017, Apr. 20, 1977, Pat. No. 4,142,000. This application Oct. 2, 1978, Ser. No. 948,023
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—281 18 Claims



1. A method of injecting fluid into a meat product or the like, by a fluid pump fluidly connected to a fluid manifold which is fluidly connected to a plurality of needles which are intermittently inserted into and withdrawn from said meat product, comprising,

inserting said needles into said meat product and withdraw-

ing said needles from said meat product in penetration and retraction strokes, respectively,

varying the velocity of inserting and withdrawing of said needles with respect to said meat product during said penetration and retraction strokes,

supplying fluid to said meat product from said fluid pump through said manifold and said needles during at least a portion of the time that said needles are within said meat product at a rate proportional to the velocity of said needles with respect to said meat product, whereby the rate of flow of fluid into said meat product is greater at the higher velocities of the needles, and is less at the lower velocities of said needles, and

adjusting to a predetermined amount the quantity of fluid supplied to said meat product.

8. A machine for injecting fluids into meat products and the like, comprising,

a support means adapted to support a meat product to be injected,

a fluid manifold movably mounted to and extending above said support means and being movable between upper and lower positions with respect to said support means,

a plurality of injecting needles extending downwardly from said fluid manifold and being adapted to pierce the meat product thereunder when said fluid manifold is moving towards its said lower position,

a pump in fluid communication with a source of injection fluid and in fluid communication with said fluid manifold,

power means on said support means for moving said fluid manifold between its upper and lower positions; for actuating said pump; and to vary the velocity of insertion into and withdrawal of said needles with respect to said meats,

and control means operatively connecting said pump and said fluid manifold to supply fluid to said meat product from said pump through said fluid manifold and needles during at least a portion of the time that said needles are inserted into said meat product at a rate proportional to the velocity of said needles with respect to said meat product whereby the rate of flow of fluid into said meat product is greater at the higher velocities of said needles, and is less at the lower velocities of said needles,

adjusting means associated with said pump for adjusting the quantity of fluid said pump supplies to said needles during each cycle of movement of said manifold from said upper to said lower positions.

4,220,670

METHOD FOR CHEMICALLY PEELING FRUITS AND VEGETABLES

Zenichi Mohri, Wakayama; Tetsuhiko Tominaga, Takarazuka; Junichi Tamura, Wakayama, and Shigeru Otsuka, Toyonaka, all of Japan, assignors to Toyo Seikan Kaisha, Ltd. and Kao Soap Co., Ltd., both of Tokyo, Japan

Filed May 3, 1979, Ser. No. 35,507

Claims priority, application Japan, May 15, 1978, 53-57429; May 15, 1978, 53-57430

Int. Cl.³ A23L *1/212*

U.S. Cl. 426—287 **14 Claims**

1. A method for peeling fruits or vegetables, which consists essentially of the step of: immersing the fruit or vegetable in an aqueous alkaline solution consisting essentially of (1) from 0.1 to 3.0 percent by weight of an akali, (2) from 0.005 to 1.0 percent by weight of an acid selected from the group consisting of undecylenic acid, lauric acid, myristic acid, palmitic acid, palmitoleic acid, oleic acid, linoleic acid, linolenic acid and stearic acid, and (3) the balance being essentially water, until the fruit or vegetable is substantially completely peeled.

4,220,671

INTERMEDIATE-MOISTURE FROZEN FOODS

Marvin L. Kahn, Williamsville, and Kuttikandathil E. Eapen, Kenmore, both of N.Y., assignors to Rich Products Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 917,379, Jun. 20, 1978, Ser. No. 871,995, Jan. 24, 1978, Pat. No. 4,154,863, and Ser. No. 763,613, Jan. 28, 1977, Pat. No. 4,146,652. This application Mar. 26, 1979, Ser. No. 24,129

Int. Cl.² A23L *1/40, 1/24*

U.S. Cl. 426—321 **17 Claims**

1. A microbiologically stable food product selected from the group consisting of soup concentrates and sauces comprising water, sugar, flavoring and at least one of fructose and unsaturated fat, wherein the product is substantially non-crystalline at freezer temperatures and comprises about from 15 to 55% water, sugar in a ratio to water of about from 0.8–2:1 and a minor but effective amount of flavoring, provided that the solutes content is adequate to provide the product with a water activity of about 0.8 to 0.9, the amount of fat is less than the amount of water, and in said sugar the amount of dextrose plus fructose is at least about 50% based upon the total sugar content.

4,220,672

PREPARATION OF DEEP-FROZEN LEAF VEGETABLES IN GRANULAR FORM

Bengt L. Bengtsson, Bjuv; Sven I. W. Bosund, Halsingborg, and Bertil Hylmö, Bjuv, all of Sweden, assignors to Produits Findus S.A., Vevy Suisse, Switzerland

Continuation of Ser. No. 337,257, Mar. 1, 1973, abandoned, which is a division of Ser. No. 66,888, Aug. 25, 1970, Pat. No. 3,734,751. This application Jun. 1, 1976, Ser. No. 691,696

Claims priority, application United Kingdom, Aug. 25, 1969, 42167/69

Int. Cl.² A23B *7/04*

U.S. Cl. 426—615 **9 Claims**

1. A leaf vegetable product comprising a plurality of separate, free-flowing, deep frozen granules, each granule being formed from a comminuted and partially dewatered leaf vegetable.

4,220,673

LOW-TEMPERATURE STEAM DESORBATE PROCESS FOR IMPROVED INSTANT TEA

Rudolf G. K. Strobel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 25, 1978, Ser. No. 936,951

Int. Cl.² A23F *3/02*

U.S. Cl. 426—655 **40 Claims**

1. A process for making an improved initial aqueous water soluble tea extract having improved overall fresh brewlike tealike aroma, flavor and flavor strength, said process comprising the steps of:

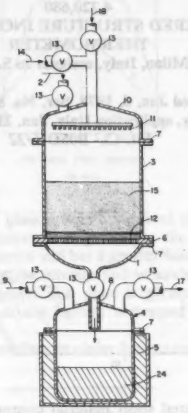
(1) pre-wetting and pre-swelling a finite upper portion of a columnar bed of ground tea leaves by passing substantially dry steam through said bed in such a manner so as to pre-wet and pre-swell only an upper portion of said ground tea leaves in said bed, said bed being held at a temperature of below about 65° F. and an absolute pressure of about 13 mbar to about 400 mbar;

(2) slowly passing water and wet steam through said bed at a flow rate that avoids flooding said bed and thereby providing a moving interface between wet swollen ground tea leaves and substantially dry tea leaves until an initial aqueous tea extract breaks through said bed, continuing the application of said water and wet stream in an amount sufficient to provide an initial aqueous tea extract having a draw-off weight ratio of extract to dry tea leaves of from 0.5:1 to 3:1, said bed being held at said temperature and said pressure until about one-half of said water

and wet steam have been applied, and then maintaining a temperature in said bed below about 72° C.;

(3) collecting said initial aqueous tea extract in a cold trap to provide said improved water soluble tea extract, said cold trap being held at an absolute pressure of about 1 to about 613 mbar and a temperature from about −180° C. to about 20° C.; and

wherein said improved water soluble tea extract composition which, upon reconstitution in water, comprises flavanols, theaflavins, thearubigins, caffeine, amino acids, and other tea compounds, in approximately the same relative amounts as a freshly brewed tea prepared from a comparable tea blend, and wherein said tea extract is more soluble at temperatures below



about 20° C. than freshly brewed tea, wherein said reconstituted tea remains substantially soluble upon cooling with ice.

12. An improved substantially dry water soluble tea composition made by the process of claim 1 which, upon reconstitution in water, comprises: flavanols, theaflavins, thearubigins, caffeine, amino acids, and other tea compounds, in approximately the same relative amounts as a freshly brewed tea prepared from a comparable tea blend, and wherein said composition has a density of about 0.05 to about 0.15 g/cc, and wherein said tea composition is more soluble at temperatures below about 20° C. than freshly brewed tea, and wherein said reconstituted tea remains substantially soluble upon cooling with ice.

4,220,674

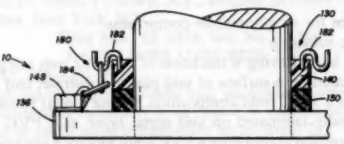
METHOD OF FILLING SCRATCHES AND PITS ON A PISTON ROD

John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.

Division of Ser. No. 850,654, Nov. 11, 1977, Pat. No. 4,123,990, which is a division of Ser. No. 721,984, Sep. 10, 1976, Pat. No. 4,089,137. This application Jun. 30, 1978, Ser. No. 920,785

Int. Cl.² B05D *1/12*; B23P *7/00*

U.S. Cl. 427—11 **4 Claims**



1. A method of filling scratches and pits on a piston rod of a hydraulic cylinder or the like, comprising the steps of:

providing an annular upper ring member of rigid material;

providing an annular lower ring member of an elastomeric material having lead particles imbedded therein;

engaging said annular ring members in surrounding relationship about the piston rod, said lower ring member being engaged in interference contact with said piston rod; and

effecting relative axial movement between the piston rod and the upper and lower ring members to cause transfer of the lead particles into any pits or scratches on the outside surface of the piston rod.

4,220,675

METHOD OF METALIC FINISHING

Yoshio Imazaki, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed May 26, 1978, Ser. No. 909,836

Claims priority, application Japan, Jun. 14, 1977, 52-70196

Int. Cl.² B05D *1/06*; C25D *13/06*

U.S. Cl. 427—27 **10 Claims**

1. A method of metallic finishing which comprises the steps of:

applying a thermosetting liquid coating material to a substrate by air spraying or electrostatic spraying, said liquid coating material containing a film forming component of thermosetting resin and a pigment for giving metallic appearance to the finished coating and said thermosetting resin component containing a cross linking agent of melamine formaldehyde resin modified with a monohydroxyl compound having a boiling point in the range of 150° to 250° C. at 1 atm.,

further applying thereon a transparent thermosetting powder coating material by electrostatic spraying, and

baking both coated films to cure them simultaneously.

4,220,676

METHODS AND COMPOSITIONS USING OAK LEAF EXTRACT

Elaine A. Holland, Rte. 1 - Box 280, Prudenville, Mich. 48651

Filed Feb. 26, 1979, Ser. No. 14,937

Int. Cl.² B08B *3/04*

U.S. Cl. 427—165 **6 Claims**

1. In a method for cleaning and wax polishing a surface of an object by means of a combination cleaner and wax applied to the surface and then rubbed against the surface the improvement which comprises:

applying and rubbing an aqueous mixture containing an effective amount of an aqueous extract of dried oak leaves containing waxes and tannins soluble or dispersible in boiling water to thereby clean and wax the surface.

4,220,677

POLYCRYSTALLINE SUPERHARD MATERIAL AND METHOD OF PRODUCING THEREOF

Dmitry V. Fedoseev; Boris V. Deryagin, both of Moscow; Valentin N. Bakul, Kiev; Alexei I. Prikhna, Kiev; Valentin K. Gerasimenko, Kiev; Vladimir G. Poltoratsky, Kiev; Jury I. Nikitin, Kiev; Stanislav P. Vnukov, and Valentin P. Varnin, both of Moscow, all of U.S.S.R., assignors to Institut Sverkhtverdykh Materialov Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Division of Ser. No. 760,902, Jan. 21, 1977, Pat. No. 4,148,964. This application Jan. 25, 1979, Ser. No. 6,520

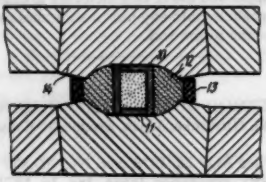
Claims priority, application U.S.S.R., Jan. 30, 1976, 2340120

Int. Cl.² B05D *7/24*

U.S. Cl. 427—215 **5 Claims**

1. A method of producing polycrystalline superhard material from cubic boron nitride, wherein said superhard material comprises sintered particles of cubic boron nitride coated over their entire surface with a layer of crystalline compounds of the chemical formula $B_xN_yC_z$, wherein x, y and z can assume any value from 0 to 1, with the proviso that the crystals of said coated layer adjacent to said boron nitride have said formula

wherein x and y approach 1 and z approaches 0, while the compounds in said coating layer distal to said boron nitride particles have said formula wherein x and y each approach 0 and z approaches 1, said crystalline compounds binding together said particles of cubic boron nitride, the method comprising introducing particles of cubic boron nitride to a gas



flow containing carbon, so that a carbon layer of 1 to 100 A thick is built up over the entire surface of the particles; and then sintering said particles of cubic boron nitride having the carbon layer built up thereon at a temperature and pressure corresponding to the region of the thermodynamic stability of cubic boron nitride.

4,220,678

DISPERSIONS FOR ACTIVATING NON-CONDUCTORS FOR ELECTROLESS PLATING

Nathan Feldstein, c/o Surface Technology, Inc., P.O. Box 2027, Princeton, N.J. 08540

Division of Ser. No. 830,456, Sep. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 731,212, Oct. 12, 1976, Pat. No. 4,136,216, which is a division of Ser. No. 607,506, Aug. 26, 1975, Pat. No. 3,993,799, which is a continuation-in-part of Ser. No. 312,224, Oct. 4, 1974, abandoned. This application Aug. 17, 1978, Ser. No. 934,344

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—305 **17 Claims**

1. A process for the preparation of non-conductor substrate prior to electroless or chemical plating which comprises contacting said substrate with a colloidal dispersion of at least one non-precious catalytic metal and a colloidal stabilizer and wherein said colloidal stabilizer is an amphoteric substance and further varying the pH of said colloidal dispersion to produce both positively or negatively charged colloids which are operative upon a multiplicity of substrates having a plurality of surface charges.

4,220,679

COATING PROCESS

Alan J. Backhouse, South Ascot, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Apr. 17, 1978, Ser. No. 897,174

Claims priority, application United Kingdom, Apr. 25, 1977, 17123/77; Aug. 10, 1977, 33500/77

Int. Cl.[2] B05D *1/36, 7/14, 5/06*

U.S. Cl. 427—401 **11 Claims**

1. A process for the production of a multilayer protective and/or decorative coating upon the surface of a substrate, which comprises the steps of:

(1) applying to the surface a base-coat composition comprising:

(A) a film-forming polymer;

(B) a volatile organic liquid diluent in which the polymer is dissolved;

(C) polymer microparticles of diameter 0.01 to 10 microns which are insoluble in the solution of the polymer (A) in the liquid diluent (B) and are stably dispersed therein in a non-flocculated state by means of a steric barrier around the particles of polymer chains which are solvated by the said solution, in an amount of at least 10% of the aggregate weight of the film-forming polymer and the microparticles;

(D) pigment particles also dispersed in the solution of the film-forming polymer in the liquid diluent;

(2) forming a polymer film upon the surface from the composition applied in step (1);

(3) applying to the base-coat film so obtained a transparent top-coat composition comprising:

(E) a film-forming polymer;

(F) a volatile carrier liquid for the polymer;

(4) forming a second polymer film upon the base-coat film from the composition applied in step (3).

4,220,680

MULTILAYERED STRUCTURE INCORPORATING A THERMOMETER

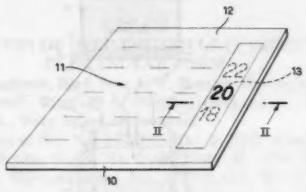
Pietro E. Corsi, Milan, Italy, assignor to S.p.A. Cellograf-Simp, Milan, Italy

Filed Jan. 6, 1978, Ser. No. 867,616

Claims priority, application Italy, Jan. 21, 1977, 20492/77[U]

Int. Cl.[2] B05D *1/32*

U.S. Cl. 428—1 **2 Claims**



1. A multilayered sheet material comprising a transparent upper layer and underlying sheet means having a recess formed therein, said recess housing a layer of porous flexible material and housing a temperature indicating strip of pliable material superimposed on said layer of porous material, said temperature indicating strip containing liquid crystals which change their color as the temperature varies.

4,220,681

TRIM FOR AUTOMOBILES

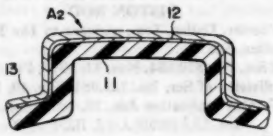
Kozi Narita, Nagoya, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1978, Ser. No. 967,631

Claims priority, application Japan, Nov. 28, 1978, 53-147636

Int. Cl.[2] B60R *13/02, 13/04*

U.S. Cl. 428—31 **3 Claims**



1. A trim for an automobile comprising:

a plastic substrate

a metal layer having a thickness of 0.03–0.2 mm integrally laminated on a surface of said plastic substrate; and

a film of a PVC resin composition having a matt finish and integrally laminated on said metal layer, said PVC resin composition comprising a PVC resin having a viscometric degree of polymerization, $\overline{P}$, of 2000–5000 and 20–50 parts by weight per 100 parts of said PVC resin of a calcium carbonate filler.

4,220,682

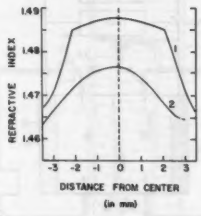
STRENGTHENED GLASS STRUCTURAL MEMBER

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034, and Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903

Division of Ser. No. 635,727, Nov. 26, 1975, Pat. No. 4,110,096, which is a continuation-in-part of Ser. No. 462,481, Apr. 22, 1974, Pat. No. 3,938,974, which is a continuation-in-part of Ser. No. 559,512, Mar. 18, 1975, abandoned. This application Jun. 19, 1978, Ser. No. 917,101

Int. Cl.[2] B32B 7/02; B65D 1/02

U.S. Cl. 428—35 13 Claims



1. A rigid shaped glass article comprised of a glass whose glass transition temperature is greater at the surface of said article than in the interior and has a greater silica concentration at the surface than in the interior and wherein the concentration of silica throughout said glass is greater than 80 mole percent, said glass article having a stepped glass transition temperature profile.

12. An article according to claim 1 wherein said article is a glass container.

4,220,683

METHOD OF THERMOFORMING AND PRODUCT MADE THEREFROM

Peter J. Barker, Royston, and Gerald R. Cheal, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 785,301, Apr. 6, 1977, Pat. No. 4,141,771. This application Nov. 2, 1978, Ser. No. 957,195

Claims priority, application United Kingdom, Apr. 28, 1976, 17255/76

Int. Cl.[2] B32B 7/00; B65D 7/00; A47K 1/00

U.S. Cl. 428—35 3 Claims

1. A shaped article which has been shaped from a sheet of poly(methyl methacrylate) having a thickness of at least 3.0 mm, a reduced viscosity of at least 1.5 and carrying an adhered protective layer of polyethylene having a melt flow index as measured by ASTM Method 1238-70 of between 1 and 4 and having a thickness of at least 40 microns wherein the polyethylene is in intimate contact with at least one surface of the shaped article.

3. A shaped article according to claim 1 in which the article is an article of sanitaryware such as a bath, shower-tray or wash basin.

4,220,684

COEXTRUDED LAMINAR THERMOPLASTIC BAGS

Robert H. Olson, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,546

Int. Cl.[2] B65D 31/02; B32B 27/08

U.S. Cl. 428—35 3 Claims

1. A laminar thermoplastic bag, particularly suited for the containment of foodstuffs to be heated in water which is maintained at an elevated temperature up to about 212° F., which consists of a two-layer laminate comprising an outer film layer of nylon-6 and an inner film layer of a mixture of high density polyethylene, having a density of from about 0.930 up to about 0.960, and from about 5 percent up to about 25 percent of weight of an adhesion promoting resin.

4,220,685

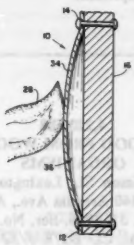
PASSIVE FIRE PROTECTION SYSTEM

Edward G. Markow, Oakdale, and John R. Penn, III, Jamaica, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jul. 19, 1978, Ser. No. 925,944

Int. Cl.[2] E06B 5/16; E04B 1/94; B32B 15/04

U.S. Cl. 428—103 12 Claims



1. A passive fire protection system for a structure to be shielded against high rise rate thermal inputs consisting of a thin protective foil of heat resistant metallic material fixedly fastened in intimate contact with and conforming to the surface of said structure covering the areas thereof that have a liability of being exposed to high temperatures, the thermal expansion of said foil when subject to a high heat input forming a blister which bulges away from said structure and in the direction of the source of said heat such that an air space thermally insulating said structure is created.

4,220,686

ENCAPSULATED IMPREGNATED ROVINGS

Richard L. Brook, Mount Prospect, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 12, 1975, Ser. No. 557,656

Int. Cl.[2] D02G 3/00

U.S. Cl. 428—375 7 Claims

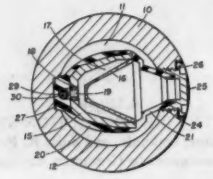
1. A solid impregnated roving comprising a fibrous roving impregnated with a thermosetting resin in uncured semi solid form, said impregnated roving being encapsulated within a thin membrane coating of thermoplastic encapsulating resin which is compatible in a hot melt with said thermosetting resin.

4,220,687

POWDERED METAL CASING FOR PERFORATING CHARGE AND ITS METHOD OF MANUFACTURE

Glenn B. Christopher, Fort Worth, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Mar. 17, 1978, Ser. No. 887,567
Int. Cl.[2] B22F 3/00; E21B 43/26, 43/111
U.S. Cl. 428—546 4 Claims



1. A shaped charge casing formed solely of a green compact consisting of powdered metal sufficiently compressed to form a jet upon explosion of said shaped charge while being reduced to a powder by said explosion.

4,220,688

PROTECTING WOOD FROM WOOD DEGRADING ORGANISMS

Ralph Mitchell, 27 Mason St., Lexington, Mass. 02173, and Thomas D. Sleeter, 840 Arcadia Ave., Arcadia, Calif. 91006

Filed Aug. 31, 1978, Ser. No. 938,402
Int. Cl.[2] B27K 3/52
U.S. Cl. 428—541 16 Claims

1. An improved process for protecting wood which comprises the steps of impregnating wood with a solution of tannic acid in a concentration of 5–50% weight per volume for protecting from wood degrading organisms and placing said wood, for use, in seawater,

and of impregnating said wood with a 1–50% weight per volume solution of a metal salt,

of which the metal is capable of complexing with both the impregnated tannic acid and the wood.

14. An article of commerce produced in accordance with the process of claim 1.

4,220,689

GALLING RESISTANT AUSTENITIC STAINLESS STEEL POWDER PRODUCT

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignors to Armco Inc., Middletown, Ohio

Division of Ser. No. 910,484, May 30, 1978, Pat. No. 4,146,412, which is a division of Ser. No. 751,022, Dec. 14, 1976, Pat. No. 4,099,967. This application Jan. 26, 1979, Ser. No. 6,641
Int. Cl.[2] C22C 38/02, 38/58
U.S. Cl. 428—558 4 Claims

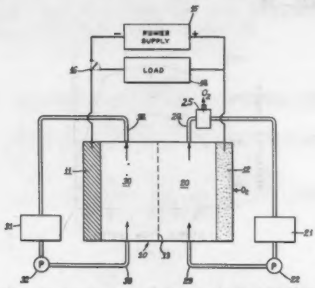
1. Austenitic stainless steel in particulate form adapted for compacted, pressed, and/or sintered products, consisting essentially of, in weight percent, about 13% to about 19% chromium, about 13% to about 19% nickel, 0.5% to about 4% manganese, 3.5% to about 7% silicon, up to about 0.15% carbon, less than 0.04% nitrogen, about 0.03% maximum phosphorus, about 0.05% maximum sulfur, and balance iron except for incidental impurities.

4,220,690

SECONDARY ZINC/OXYGEN ELECTROCHEMICAL CELLS USING INORGANIC OXYACID ELECTROLYTES

Keith F. Blurton, Hinsdale, and Anthony F. Sammells, Naperville, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 28, 1979, Ser. No. 52,970
Int. Cl.[2] H01M 8/04
U.S. Cl. 429—15 33 Claims



1. A secondary zinc/oxygen electrochemical cell comprising a cell container divided into a first and second electrolyte compartment by an ionically conducting separator; an aqueous inorganic oxyacid electrolyte in each of said compartments, a zinc anode in contact with circulating electrolyte in said first compartment, a catalyzed oxygen cathode in contact with circulating electrolyte in said second compartment, means for circulating said electrolyte in said first and second compartments, and an external load circuit or charging circuit in electronic communication with said anode and said cathode, the circuit being completed by ionic interaction between electrolyte compartments through said ionic separator and electrons through the external load circuit or charging circuit.

12. A process for production of electricity by use of a secondary zinc/oxygen electrochemical cell having an aqueous inorganic oxyacid electrolyte comprising:

contacting a zinc anode with a flowing aqueous inorganic oxyacid anolyte causing oxidation of the zinc anode;

contacting a catalyzed oxygen cathode with oxygen and a flowing aqueous inorganic oxyacid catholyte causing reduction of oxygen to form water;

withdrawing electrical energy from said cell by loading an external circuit in electronic communication with said anode and cathode; and

completing the electrical circuit by contacting one side of an ionically conducting separator with said anolyte and the other side with said catholyte, providing ionic interaction between the two electrolytes.

23. A process for recharging a secondary zinc/oxygen electrochemical cell having an aqueous inorganic oxyacid electrolyte comprising:

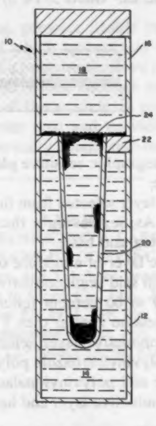
providing electrical energy from an external circuit to a zinc anode and a catalyzed oxygen cathode;

contacting said zinc anode with a flowing aqueous inorganic oxyacid anolyte transporting zinc salts of said inorganic oxyacid anolyte to add zinc to said anode;

contacting said catalyzed oxygen cathode with flowing aqueous inorganic oxyacid catholyte to produce oxygen and venting said oxygen; and

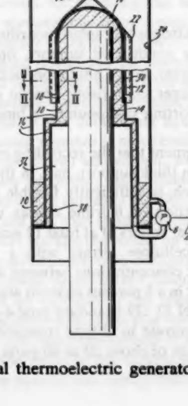
completing the electrical circuit by contacting one side of an ionically conducting separator with said anolyte and the other side with said catholyte, providing ionic interaction between the two electrolytes.

4,220,691
SODIUM SULFUR CELL
Walter L. Roth, Schenectady, and Stephan P. Mitoff, Clifton Park, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.
Filed Sep. 25, 1978, Ser. No. 945,624
Int. Cl.² H01M *12/39*
U.S. Cl. 429—104 **13 Claims**



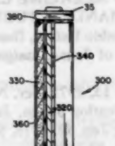
1. In an improved sodium sulfur cell including means for containing molten sulfur, means for containing molten sodium, and a solid sodium ion conductive electrolyte separator between said sulfur containing means and said sodium container, the improvement comprising gettering means for potassium and alkaline earth metals disposed on the sodium side of said separator, said gettering means being of significantly higher surface area than that of the sodium side of said tube.

4,220,692
INTERNAL GEOMETRY OF ALKALI METAL THERMOELECTRIC GENERATOR DEVICES
Thomas K. Hunt, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Feb. 28, 1979, Ser. No. 16,240
Int. Cl.² H01M *4/36*
U.S. Cl. 429—104 **2 Claims**



1. In an alkali metal thermoelectric generator device that converts heat energy directly to electrical energy by electrochemical expansion of alkali metal across an electrolyte membrane having a porous electrode thereon that serves to transport electrons for recombination with alkali metal cations passing through the electrolyte, the improvement which comprises a porous electrode on textured electrolyte that during operation of the thermoelectric generator device causes at least a portion of energy radiating from a portion of the porous electrode to impinge directly upon another portion of the electrode.

4,220,693
COMPOSITE SEPARATOR/ABSORBENT
Ralph B. Di Palma, New Hyde Park, and Anthony Loh, Jr., Croton Falls, both of N.Y., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.
Filed Aug. 23, 1978, Ser. No. 936,303
Int. Cl.² H01M *2/18*
U.S. Cl. 429—133 **12 Claims**



1. An electrochemical cell comprising an anode, a cathode, a fluid electrolyte, with separating means and electrolyte absorbent means between said anode and cathode characterized in that said separating means comprises at least one layer of a thin ionically permeable film comprised of a member of the group consisting of polyethylene, polypropylene, polyvinyl chloride, nylon, acrylonitrile, polyhalogenated carbon resins, polystyrene, ion exchange grafts thereof and mixtures thereof and said electrolyte absorbent means comprises at least one layer of a synthetic non-woven, fibrous, thermally bondable mat wherein said thin film layer and said thermally bondable non-woven mat layer have contiguous surfaces between said anode and cathode with said surfaces being thermally adhered to one another by heat seals which are distributed over said contiguous surfaces and which occupy a minor area of said contiguous surfaces.

4,220,694

LEAK-PROOF ALKALINE CELL AND ITS PRODUCTION

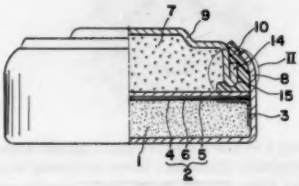
Yoshio Uetani; Yasuyoshi Taniguchi; Kenichi Yokoyama, and Seiichi Matsushima, all of Osaka, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed May 31, 1979, Ser. No. 44,248

Claims priority, application Japan, May 31, 1978, 53-66133; May 31, 1978, 53-66135; May 31, 1978, 53-66137; May 31, 1978, 53-66139

Int. Cl.[2] H01M 2/08

U.S. Cl. 429—172 9 Claims



1. A leak-proof alkaline cell comprising a negative electrode collector and a gasket, characterized in that the negative electrode collector is coated with a film comprising a triazole compound at least at the part contacting the gasket.

4,220,695

LEAK-PROOF ALKALINE CELL AND ITS MANUFACTURE

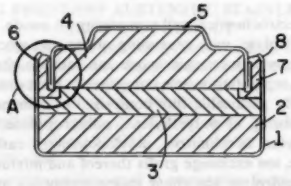
Osamu Ishida, Suita; Yoshio Uetani, Ibaraki, and Seiichi Matsushima, Toyonaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jun. 13, 1979, Ser. No. 48,225

Claims priority, application Japan, Jun. 13, 1978, 53-71885; Jun. 13, 1978, 53-71886; Jun. 13, 1978, 53-71887; Jun. 13, 1978, 53-71889; Jun. 13, 1978, 53-71890

Int. Cl.[2] H01M 2/08

U.S. Cl. 429—172 7 Claims



1. A leak-proof alkaline cell comprising a positive can and a negative electrode collector provided at the opening end of the positive can with intervention of a gasket so as to make the inside of the cell liquid-tight, characterized in that the gasket is made of a polyamide resin and has a moisture content of not more than 0.3% by weight.

4,220,696

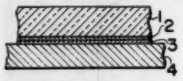
ELECTROPHOTOGRAPHIC PLATE WITH MULTIPLE LAYERS

Susumu Tanaka, Sakai, and Katsutoshi Konishi, Fujiidera, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 151,713, Jun. 10, 1971, abandoned. This application Feb. 24, 1975, Ser. No. 553,448

Int. Cl.[2] G03G 5/14, 5/082

U.S. Cl. 430—59 10 Claims



1. An electrophotographic sensitive plate, comprising:

a conductive base;

a semiconductive layer selected from the group consisting of Se, As_2S_3 and As_2Se_3 having a thickness of less than 1 micron overlaying said base;

a photoconductive layer of a mixture of selenium and tellurium disposed on said semiconductive layer and containing between 10 to 60 percent tellurium by weight and having a thickness no greater than 1 micron; and

an organic semiconductive layer selected from the group consisting of polyvinylcarbazole polyamide resin, polyvinyl-naphthalene and polyvinyl-malachite green disposed on said photoconductive layer and having a thickness of 5 to 30 microns.

4,220,697

ELECTROPHOTOGRAPHIC RECORDING MATERIAL

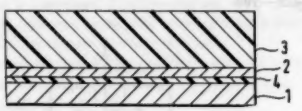
Wolfgang Wiedemann, Geisenheim-Johannisberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,391

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734288

Int. Cl.[2] G03G 5/06

U.S. Cl. 430—59 11 Claims



1. In an electrophotographic recording material comprising an electrically conductive support, optionally an insulating intermediate layer, and a photoconductive layer composed of at least one layer comprising charge carrier-producing and charge transporting compounds, a binder, and conventional additives,

the improvement that the recording material comprises a 75 to 250 μm thick support, and, in the form of a photoconductor web, is sufficiently flexible that it is not prone to the formation of hairline cracks when repeatedly conducted over rollers of at least 12 mm diameter, said binder being a cellulose nitrate with a viscosity of 400±25 cPoises at concentrations between about 4 and 12 percent by weight in a 5 percent aqueous acetone solution, according to DIN 53 179 (standard type 4–12), the proportion of cellulose nitrate to charge transporting compound being in the range of about 20 to 60 parts by weight to 40 to 80 parts by weight.

4,220,698

DIRECT IMAGING PRESSURE FIXABLE MAGNETIC TONERS

Carl Brynko, and Carl G. Brynko, both of Oakland, N.J., assignors to Reprographic Materials, Inc., Pompton Lakes, N.J.

Division of Ser. No. 837,693, Sep. 29, 1977, Pat. No. 4,133,774.
This application Dec. 20, 1978, Ser. No. 971,206
Int. Cl.[2] G03G *9/14*
U.S. Cl. 430—109 4 Claims

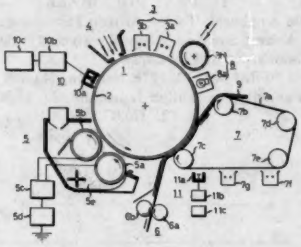
1. A direct imaging, pressure fixable particulate magnetic toner, the particles of which successively comprise a core of magnetic material and a pressure-sensitive resin, a substantially continuous barrier coat which encloses and shields the core from the remainder of the particle, a pressure friable resin overcoating said barrier coat and providing strength to the particles, and an electrically conductive outer layer.

4,220,699

METHOD FOR PRODUCING A LARGE NUMBER OF COPIES BY MEANS OF COPYING APPARATUS

Tsutomu Ishida, Tokyo, and Takehiko Iwaoka, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed May 17, 1978, Ser. No. 906,741
Claims priority, application Japan, Jun. 3, 1977, 5264635
Int. Cl.[2] G03G *13/16, 15/16*
U.S. Cl. 430—126 7 Claims



1. A method for producing a large number of copies from a single electrostatic latent image by means of a copying apparatus, comprising the steps of forming an electrostatic latent image on an electrostatic image bearing member, developing said electrostatic latent image into a visible image by using a developing agent comprising a toner and a carrier, and printing said visible image on a copy sheet by transfer printing, wherein said process steps are repeatedly carried out a plurality of times and the carrier of the developing agent has the property of being electrically insulated for reducing the leakage of the charge carried by the electrostatic latent image, while a bias voltage of the same polarity as the electrostatic latent image is impressed on a developing device at least during a developing operation, said method further comprising the steps of selecting materials for the surface of the electrostatic image bearing member and the carrier of the developing agent so that the electrostatic image bearing member is more easily electrostatically chargeable than the carrier and so that, with an increase in the number of copies produced, the absolute value of the surface potential of non-image agreas of the electrostatic image bearing member first falls and then gradually rises, and changing the values of the bias voltage impressed on the developing device substantially in accordance with changes in the surface potential of the non-image areas of the electrostatic image bearing member with an increase in the number of copies produced with the absolute value of the bias voltage impressed on the developing device being maintained at a level slightly higher than the absolute value of the surface potential of the non-image areas of the electrostatic image bearing member.

4,220,700

CONTINUOUS-TONE DYED DIAZO IMAGING ELEMENTS

Hugh G. McGuckin, Rochester, and Hyman L. Cohen, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 840,879, Oct. 11, 1977, abandoned. This application Feb. 3, 1978, Ser. No. 874,970
Int. Cl.[2] G03C *1/84, 1/52*
U.S. Cl. 430—143 11 Claims

1. A wash-off light-sensitive composition, comprising, in admixture,

as a photo-hardenable material, a water-soluble, light-sensitive diazo resin,

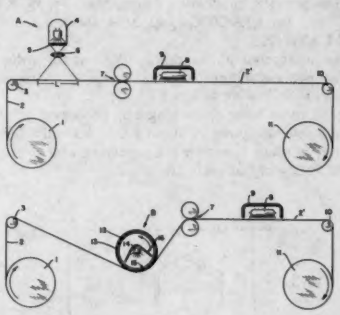
and a mordant for an anionic dye, said mordant being different from and compatible with said resin and retained by the photohardened form of the composition.

4,220,701

METHOD OF PHOTOGRAPHIC TRICHROMATIC PRINTING

Jean J. Robillard, Ferney-Voltaire, France, assignor to Roval S.A., Geneva, Switzerland

Continuation of Ser. No. 785,221, Apr. 6, 1977, abandoned. This application May 1, 1979, Ser. No. 35,082
Claims priority, application France, Apr. 8, 1976, 76 10255
Int. Cl.[2] G03C *1/58, 1/52*
U.S. Cl. 430—151 11 Claims



4. A photosensitive emulsion wherein comprises:

(a) a binder;

(b) three types of semiconductor oxide grains dispersed in the binder each adapted to desorb OH^- ions under the action of one of three monochromatic radiations corresponding to the three primary colours (red, blue or green), respectively, these three types of grain being each sensitized respectively to the said radiation by means of an organic chromatic sensitizer adsorbed in the grains; and either

(c) a diazo system comprising a diazonium salt dispersed in the binder and three couplers adapted to react with the diazonium salt to obtain a diazo dye, each of the three couplers being adsorbed at the surface of the grains of a given type, or being disposed in the immediate vicinity thereof, and being adapted to form with the diazonium salt a dye whose colour is complimentary (cyan, yellow or magenta) to that corresponding to the radiation to which the said type of grain is sensitized; or

(c') a diazo system comprising a coupler dispersed in the binder and three diazonium salts adapted to react with the coupler to obtain a diazo dye, each of the three diazonium salts being adsorbed at the surface of the grains of a given type, or being disposed in the immediate vicinity thereof, and being adapted to form with the coupler a dye whose colour (cyan, yellow or magenta) is complementary to that corresponding to the radiation to which the said type of grain is sensitized.

4,220,702

METHOD FOR MAKING A LITHOGRAPHIC PRINTING PLATE

Yasuo Tsubai, and Shigeyoshi Suzuki, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 20, 1978, Ser. No. 944,072
Claims priority, application Japan, Dec. 15, 1977, 52-151104
Int. Cl.[2] G03C 5/54; G03F 7/02
U.S. Cl. 430—204 7 Claims

1. In a method for making a lithographic printing plate utilizing the silver complex diffusion process, which method comprises forming an original plate for lithographic printing plate which uses silver image areas formed by a photographic process and rendered ink-receptive and subjecting the plate to photographic treatments of development and neutralization and then to treatment for making the plate insensible to oil, the improvement which comprises a neutralizing solution used for said neutralizing treatment containing colloidal fine particles and a hygroscopic polyol compound, wherein said particles are selected from the group consisting of colloidal silica and colloidal alumina.

4,220,703

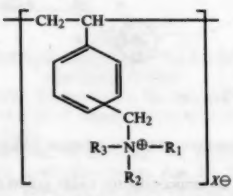
PHOTOGRAPHIC RECEIVING LAYER WITH ACID PROCESSED GELATIN

Kazunobu Katoh, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 27, 1979, Ser. No. 24,331
Claims priority, application Japan, Mar. 28, 1978, 53/35755
Int. Cl.[2] G03C 1/40, 5/54; B44D 1/09
U.S. Cl. 430—213 14 Claims

7. An integrated photographic element for color diffusion transfer process comprising a transparent support having thereon the following layers:

(a) a mordant layer containing acid processed gelatin having an isoelectric point of about 6.0 to 9.3 and a homopolymeric mordant containing a repeating unit represented by the following formula (I):



wherein R_1, R_2 and R_3, which may be the same or different, each represents an alkyl group and the total number of carbon atoms in R_1, R_2 and R_3 is 12 or more; and $X^{\ominus}$ represents an anion,

(b) at least one light-sensitive silver halide emulsion layer associated with a dye image-providing material.

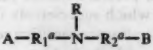
4,220,704

WATER SOLUBLE PHOTOSENSITIVE RESIN COMPOSITIONS COMPRISING A POLYAMIDE OR ITS SALT

Kuniomi Etoh, and Masaru Nanpei, both of Otsu, Japan, assignors to Toyobo Co., Ltd., Osaka, Japan

Division of Ser. No. 781,307, Mar. 25, 1977, which is a continuation of Ser. No. 525,106, Nov. 19, 1974, Pat. No. 4,145,222. This application Jan. 29, 1979, Ser. No. 7,197
Int. Cl.[2] G03C 1/68
U.S. Cl. 430—281 20 Claims

1. A water-soluble photosensitive resin composition which comprises a polyamide or its ammonium salt having recurring amide groups in the main chain thereof and basic nitrogen atoms in the main or side chain thereof, from 5 to 150% by weight with respect to said polyamide or its ammonium salt of a photopolymerizable unsaturated monomer and from 0.01 to 5% by weight with respect to the total amount of said polyamide or its ammonium salt and the photopolymerizable unsaturated monomer, of a photosensitizer, said polyamide being prepared by the polycondensation of starting monomers comprising from 10 to 100 mol % of a compound having the following formula:



(II)

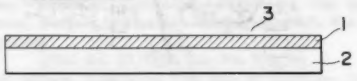
wherein R is a hydrogen atom or a hydrocarbon group, R_1^a and R_2^a are each an alkylene group, and A and B are each $-NH_2$, —COOH or —COOR″ wherein R″ is a hydrocarbon group, said ammonium salt being prepared by the treatmnt of said polyamide with a protonic acid, a quaternizing agent or an epoxy compound and a protonic acid.

4,220,705

PROCESS FOR MANUFACTURING A MULTI-COLORED DISPLAY POLARIZER

Shigeyoshi Sugibuchi, Tokyo; Mitsuo Hiramatsu, Fujimi, and Takeo Aizawa, Sano, all of Japan, assignors to Sanritsu Denki Kabushikikaisha, Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,686
Claims priority, application Japan, Jul. 26, 1978, 53/93558
Int. Cl.[2] G03C 5/00
U.S. Cl. 430—294 15 Claims



1. In a process for producing a polarizer comprising a film and a transparent support substrate, the improvement comprising the steps of coating a normally liquid photo-sensitive resin onto the surface of a polyvinyl alcohol film blank oriented in one direction and drying said coating; exposing said coated film blank to light through a first photographic negative to photo-set said photosensitive resin at portions thereof corresponding to transparent portions of said first negative; developing the thus exposed film blank by dissolving and removing the resin remaining on the unexposed portions of said coated film blank to reveal the film blank thereunder; causing ink containing iodine and a first dyestuff to be adsorbed into said oriented film blank at said revealed portions thereof; removing said photo-set resin from the exposed portions of said film blank by use of an organic solvent containing xylene; applying another coating of a photosensitive resin to the thus obtained film blank and drying said coating; exposing said obtained coated film blank to light through a second photographic negative having opaque portions corresponding to the transparent portions of said first photographic negative to photo-set said photosensitive resin at portions corresponding to the transparent portions of said second negative; developing the thus exposed film blank by dissolving and removing the resin remaining on the unexposed portions of said film blank to reveal the film blank thereunder; causing ink containing iodine and a second dyestuff to be adsorbed into said film blank at revealed portions thereof; and removing said photo-set resin from the exposed portions of said film blank, thereby producing a multi-colored display polariser.

4,220,706

ETCHANT SOLUTION CONTAINING $HF-HNO_3-H_2SO_4-H_2O_2$ FOR ETCHING AL-TI-CU OR NI CONTACT METALLURGY ON SILICON SUBSTRATES

Mark A. Spak, Edison, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 10, 1978, Ser. No. 904,541
Int. Cl.[2] H01L *21/44, 21/88, 21/465*
U.S. Cl. 430—318 5 Claims

1. A method of etching three or more metal layers on a silicon-containing substrate using a single etchant which comprises applying a photoresist over the metal layers, exposing the photoresist through a mask, developing the photoresist to reveal portions of the metal layers and immersing the wafer in an etchant solution comprising from about 0.5 to 50 percent by weight of nitric acid, from about 0.03 to 1 percent by weight of hydrofluoric acid, from about 0.05 to 0.5 percent by weight of hydrogen peroxide and from about 0.1 to 1.0 percent by weight of sulphuric acid until the metal not covered by photoresist has dissolved.

2. A method according to claim 1 wherein said metal layers comprise a first layer of aluminum from about 0.1 to 8 microns thick; a second layer of titanium, molybdenum or tungsten from about 0.2 to 0.7 micron thick; and a third layer selected from the group consisting of nickel and copper or both from about 0.4 to 2 microns thick.

3. A method according to claim 1 wherein said silicon-containing substrate is selected from the group consisting of silicon, doped silicon, polycrystalline silicon, oxygen-doped polycrystalline silicon, silicon oxide and silicon nitride.

4,220,707

EPOXY RESIN COMPOSITION FOR IMAGE FORMATION

Kaoru Ohmura; Kiichiro Sasaguri, and Kazuo Toyomoto, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 639,768, Dec. 11, 1975, abandoned. This application Apr. 24, 1978, Ser. No. 898,793
Claims priority, application Japan, Dec. 20, 1974, 49-145732
Int. Cl.[2] G03C *5/00, 1/68*
U.S. Cl. 430—325 6 Claims

1. A process for forming concave-convex images which comprises

applying a coating of an organic solvent solution containing an epoxy resin composition comprising (a) an epoxy compound having an average of one or more epoxy groups per molecule, (b) an amine curing agent selected from the group consisting of aromatic primary amines, aromatic secondary amines, aromatic tertiary amines, aliphatic amines, heterocyclic amines and alicyclic amines, and (c) a reductive metal compound selected from the group consisting of cupric bromide, ferric chloride, ferric bromide, tellurium tetrachloride, and ferric ammonium oxalate on a substrate,

drying the said coating, exposing the dried coating to energy irradiation,

curing the resulting coating with heating or at room temperature, and

removing the uncured parts with a solvent.

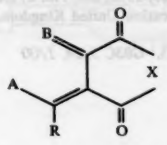
4,220,708

PHOTOCHROMIC COMPOUNDS

Harold G. Heller, 11 Erw Goch, Waun Fawr, Aberystwyth, Wales

Continuation-in-part of Ser. No. 719,254, Aug. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,975, Jul. 29, 1975, abandoned. This application Oct. 27, 1977, Ser. No. 846,148
Claims priority, application United Kingdom, Jul. 22, 1977, 30894/77
Int. Cl.[2] G03C *1/733;* C07D *405/06*
U.S. Cl. 430—336 25 Claims

1. A photochromic compound of the general formula:



(II)

wherein

X represents oxygen or $\geqq NR_6$, R_6 being hydrogen or an alkyl, aryl or aralkyl group;

R represents an alkyl or aryl group;

A represents a 3-furyl, 3-thienyl, 3-benzofuryl or 3-benzothienyl group; and

B represents an adamantylidene group or the grouping

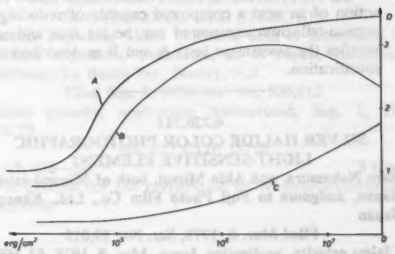
in which R_2 and R_3 independently represent an alkyl, aryl, or a heterocyclic group containing a furyl or thienyl ring or one of R_2 and R_3 represents hydrogen and the other represents an alkyl or aryl group.

4,220,709

HEAT DEVELOPABLE IMAGING MATERIALS AND PROCESS

Richard A. deMauriac, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 684,699, May 10, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,876
Int. Cl.[2] G03C *5/30, 1/02*
U.S. Cl. 430—353 41 Claims



28. A process of developing an image in an exposed heat-developable, photographic element comprising a support having thereon in reactive association

(a) photosensitive silver halide,

(b) an image forming combination comprising

(i) a complex of silver with a nitrogen acid selected from

the group consisting of imidazole, pyrazole, urazole, 1,2,4-triazole and 1H-tetrazole nitrogen acid and combinations thereof with (ii) an organic reducing agent, and

(c) a polymeric binder,

comprising heating said element to a temperature within the range of about 120° C. to about 180° C. until said image is developed.

4,220,710

PHOTOSENSITIVE RECORDING MATERIALS

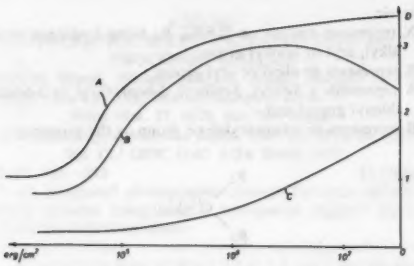
Wilhelmus Janssens, Aarschot; Frans C. Heugebaert, Koatich, and Hendrik E. Kokelenberg, Merksem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Jan. 23, 1978, Ser. No. 871,409

Claims priority, application United Kingdom, Jan. 25, 1977, 2990/77

Int. Cl.² G03C *5/24, 1/00*

U.S. Cl. 430—353 **13 Claims**



1. A photosensitive recording material containing in admixture in a binder medium:

1. as imaging substance an organo-tellurium compound containing directly linked to a tellurium atom halogen and at least one organic substituent comprising at least one carbonyl group,
2. a photoreductant which upon exposure to activating radiation in the presence of a hydrogen-donating compound reduces said organo-tellurium compound to liberate metallic tellurium and halogen acid,
3. a hydrogen-donating compound from which hydrogen can be abstracted by the photo-exposed photoreductant, and
4. an organic reducing agent precursor, from which by the action of an acid a compound capable of reducing said organo-tellurium compound can be set free and which satisfies the assessment tests A and B as described in the specification.

4,220,711

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Kotaro Nakamura, and Akio Mitsui, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

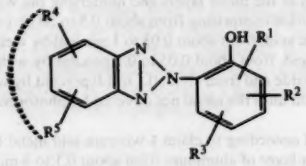
Filed Mar. 8, 1979, Ser. No. 19,019

Claims priority, application Japan, Mar. 9, 1978, 53-26834

Int. Cl.² G03C *1/84, 1/40, 1/76*

U.S. Cl. 430—507 **13 Claims**

1. A silver halide color photographic light sensitive element comprising a support having thereon at least one interlayer which comprises a soluton prepared by dissolving at least one hydrophobic compound represented by the following general formula (I) in an alkyl phosphoric acid ester represented by the following general fomula (III) dispersed in a gelatin containing hydrophilic colloid, said interlayer not containing any dye image forming agents; and having thereon at least two silver halide emulsion layers containing different color-forming couplers selected from the group of silver halide emulsion layers consisting of a green-sensitive silver halide emulsion layer containing a magenta color-forming coupler, a blue-sensitive silver halide emulsion layer containing a yellow color-forming coupler, and a red-sensitive silver halide emulsion layer containing a cyan color-forming coupler and having between at least one pair of successive silver halide emulsion layers an interlayer as described above:



(I)

wherein R^1, R^2, R^3, R^4 and R^5 may be the same or different and each represents a hydrogen atom, a halogen atom, a nitro group, a hydroxyl group, an alkyl group, an alkenyl group, an aryl group, an alkoxy group, an acyloxy group, an aryloxy group, an alkylthio group, an arylthio group, an aralkylthio group, a mono- or a di-alkylamino group, an acylamino group or a 5- or a 6-membered heterocyclic ring containing an oxygen or a nitrogen atom and further, R^4 and R^5 may be combined to form a 5- or a 6-membered aromatic ring consisting of carbon atoms;

(III)

wherein R^6, R^7 and R^8 each represents a branched chain alkyl group having 8 or more carbon atoms, where the total number of carbon atoms contained in these three groups is about 24 to 40.

4,220,712

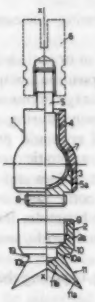
DENTAL IMPLANT AND METHOD OF INSERTING

Nicola Staffolani, Perugia, Italy, assignor to Pantomedical Grifo S.A.S. and Nicola Staffolani, both of Perugia, Italy

Filed Mar. 6, 1978, Ser. No. 883,841

Int. Cl.² A61C *8/00*

U.S. Cl. 433—173 **10 Claims**



1. An apparatus for mounting a dental prosthesis, comprising:

a first pin means for carrying a holder means for supporting at least one tooth, said first pin means having a lower spheric head portion;

a first body which includes a spheric inner duct means for receiving the lower spheric head portion of the first pin means, said first body having the inner surface of its duct means covered by a layer of an elastomeric material, said first body also having an externally threaded lower end extending downwards;

a second body including an upper internally threaded portion and a lower end portion, the bottom of this lower end portion being divided in sections forming guide tangs with external tips; and

a second pin means, to be received inside the lower end portion of the second body, for causing and maintaining the outward rotation of the external tips up to substantially transverse anchoring positions when implanted into fibromucous membrane.

4,220,713

STABILIZED DIAGNOSTIC AGENT

Walter Rittersdorf, Mannheim-Waldhof; Hugo Tiedemann, Mannheim-Wallstadt; Wolfgang Werner, Mannheim-Vogelstang, and Hans Wielinger, Mannheim-Waldhof, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

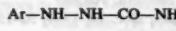
Filed Mar. 31, 1978, Ser. No. 892,362

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2716060

Int. Cl.[2] C12Q *1/54, 1/28*

U.S. Cl. 435—14 7 Claims

1. In a diagnostic agent for the detection of (a) hydroperoxides or of substances which react with the liberation of hydroperoxides or of (b) peroxidase or of peroxidatively-active substances, comprising a stabilized oxidation indicator and, in case (a), peroxidase or a peroxidatively active substance or, in case (b), hydroperoxide or a substance which reacts with the liberation of hydroperoxides, the improvement which comprises, in a stabilizing amount, a 1-arylsemicarbazide of the formula



in which Ar is aryl or aryl substituted with alkyl, alkoxy or halogen.

4,220,714

COMPOSITION FOR INHIBITING ADENYLATE-KINASE AND ITS USE

Franco Meiattini, Siena; Giuliano Giannini, and Paolo Tarli, both of Monteriggioni, all of Italy, assignors to Istituto Sieroterapico e Vaccinogeno Toscano Sclavo S.p.A., Siena, Italy

Filed Apr. 13, 1978, Ser. No. 896,201

Claims priority, application Italy, Sep. 30, 1977, 28139 A/77

Int. Cl.[2] C12Q *1/50*; C12N *9/99*

U.S. Cl. 435—17 5 Claims

1. A composition for the inhibition of adenylate kinase, said composition comprising adenosine-5[1]-monophosphate and a fluoride, at a ratio of from 1:01.5 to 1:25.

4. A method for determining creatine kinase activity said method comprising adding to the sample to be tested a composition which comprises adenosine-5[1]-monophosphate and a fluoride at a ratio of 1:01.5 to 1:25, incubating the composition-sample mixture under conditions suitable for creatine kinase activity, and thereafter spectrophotometrically measuring the creatine kinase activity.

4,220,715

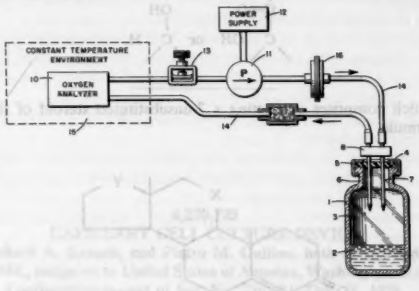
APPARATUS FOR AND METHOD OF DETECTION OF SIGNIFICANT BACTERIURIA IN URINE SAMPLES THROUGH MEASUREMENT OF HEAD SPACE GAS OXYGEN CONSUMPTION IN A CLOSED-VIAL SYSTEM

Joseph E. Ahnell, Hydes, Md., assignor to Johnston Laboratories, Inc., Cockeysville, Md.

Filed Aug. 3, 1978, Ser. No. 930,680

Int. Cl.[2] C12Q *1/04, 1/06*; C12M *1/34*

U.S. Cl. 435—34 28 Claims



1. A method of detecting a threshold quantity of oxygen consuming microorganisms in a urine sample comprising the steps of:

(a) providing a sealable, sterile container containing a sterile culture medium capable of supporting growth of microorganism found in urine samples;

(b) introducing a sample to be tested into said container, and sealing said container, the volume above said sample and medium defining a head space, and the gas initially filling this head space having a known oxygen concentration;

(c) subjecting said sealed container and its contents to conditions conducive to microorganism growth for a period of time sufficient for the growth of oxygen consuming microorganisms;

(d) withdrawing a portion of the head space gas from said container and causing the withdrawn gas to flow through a closed sampling loop which returns the withdrawn gas to the head space in the container; and

(e) subjecting the gas flowing through the closed sampling loop to analysis for oxygen concentration, a drop in oxygen concentration below a predetermined level indicating the presence of a threshold quantity of said oxygen consuming microorganisms.

4,220,716

PROCESS FOR THE PREPARATION OF 7α-HYDROXYLATED STEROIDS

Mitsuhiko Fujiwara; Akiko Fujiwara, both of Kamakura, and Chikara Miyamoto, Yokohama, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

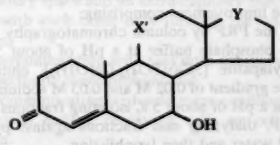
Filed Sep. 5, 1978, Ser. No. 939,613

Claims priority, application Switzerland, Sep. 2, 1977, 10733/77

Int. Cl.[2] C12P *33/06*

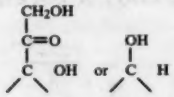
U.S. Cl. 435—58 5 Claims

1. A process for the preparation of 7α-hydroxysteroids of the formula

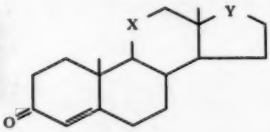


wherein X' is $-CH_2-$ or

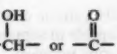
and Y is a radical of the formula



which comprises contacting a 7-unsubstituted steroid of the formula



wherein X is $-CH_2-$,



and Y is as above with a microorganism of the genus Mucor in an aqueous culture medium under aerobic conditions.

4,220,717

ISOLATION AND PURIFICATION OF POLYRIBOSYL RIBITOL PHOSPHATE FROM *HAEMOPHILUS INFLUENZAE* TYPE B.

Joseph S.-C. Kuo, Orangeburg, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 22, 1977, Ser. No. 846,488
Int. Cl.[2] C12D *13/04*
U.S. Cl. 435—101 2 Claims

1. In a method of isolating and purifying immunologically active polyribosyl ribitol phosphate (PRP), the capsular polysaccharide of *Haemophilus influenzae* type b, fermenting strains of the organism *Haemophilus influenzae* type b under conditions suitable for the production of said polysaccharide, further isolating the PRP as a hexadecyltrimethyl ammonium bromide complex, the improvement comprising:

purifying the PRP by adding hydroxylapatite [$3.Ca_3(PO_4)_2Ca(OH)_2$] in a 0.02 M sodium phosphate buffer at a pH from about 6.7 to about 6.9, mixing at a temperature of about 4° C., centrifuging, removing the supernatant and repeating the foregoing procedure at least two more times, filtering the supernatant through suitable filters, dialyzing against pyrogen-free distilled water, and then lyophilizing.

2. In a method of isolating and purifying, the capsular polysaccharide of *Haemophilus influenzae* type b, fermenting strains of the organism *Haemophilus influenzae* Type b under conditions suitable for the production of said polysaccharide, further isolating the PRP as a hexadecyltrimethyl ammonium bromide complex, the improvement comprising:

purifying the PRP by column chromatography in a 0.02 M sodium phosphate buffer at a pH of about 5.8 through hydroxylapatite [$3Ca_3(PO_4)_2.Ca(OH)_2$], eluting with a stepwise gradient of 0.02 M and 0.05 M sodium phosphate buffer at a pH of about 5.8, isolating fractions by analysis for PRP, dialyzing said fractions against pyrogen-free distilled water and then lyophilizing.

4,220,718

ANTIBIOTICS PRODUCED BY CYTOSPORA SP. W.F.P.L. 13A

Sarangamat Gurusiddaiah; Robert C. Ronald; James A. Magnuson, and Bruce A. McFadden, all of Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Mar. 1, 1978, Ser. No. 882,492
Int. Cl.[2] C12P *17/08*
U.S. Cl. 435—124 3 Claims

1. A process for the manufacture of an antibiotically active material which comprises cultivating the organism Cytospora sp. W.F.P.L. 13A in a nutrient medium until substantial antibiotic activity is obtained and then isolating an antibiotically active material from the culture.

4,220,719

PROCESS FOR THE PRODUCTION OF COENZYME Q_{10}

Kô Aida, No. 681-2, Oazanegishi, Urawa-shi, Saitama-ken, Japan; Kinya Uchida, Mitaka, Japan; Izumi Kawada, Yokohama, Japan, and Hideichi Ito, Kokubunji, Japan, assignors to Ko Aida, Urawa, Japan

Filed Mar. 7, 1979, Ser. No. 18,114
Claims priority, application Japan, Mar. 20, 1978, 53-31098
Int. Cl.[3] C12P *7/66*
U.S. Cl. 435—133 13 Claims

1. In the process for producing Coenzyme Q_{10}, which comprises cultivating a microorganism belonging to genus Cryptococcus, Rhodotorula, Sporobolomyces, Torulopsis, Sporidiobolus, Oosporidium, Aspergillus and Cladosporium, capable of producing Coenzyme Q_{10}, in a culture medium to produce Coenzyme Q_{10} and recovering Coenzyme Q_{10} from said culture medium, the improvement comprising admixing isopentenyl alcohol with said culture medium whereby the yield of Coenzyme Q_{10} is increased.

4,220,720

MANUFACTURE OF FATTY ACIDS HAVING STRAIGHT AND LONG CARBON CHAINS USING A MICROORGANISM

Akira Taoka, and Seiichi Uchida, both of Toda, Japan, assignors to Bio Research Center Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,607
Claims priority, application Japan, Dec. 14, 1977, 52-150064
Int. Cl.[2] C12D *1/02*
U.S. Cl. 435—142 4 Claims

1. In the production of C_8–C_{18} mono- and di-carboxylic acids from straight chain hydrocarbons wherein the hydrocarbon and the resulting acid have the same number of carbon atoms in the skeletal chain by aerobically cultivating the hydrocarbon with a microorganism in a nutrient medium, the improvement which comprises using as the microorganism *Debaryomyces phaffi*, ATCC 20499.

4,220,721

METHOD FOR ENZYME REUTILIZATION

George H. Emert, Merriam, and Paul J. Blotkamp, Olathe, both of Kans., assignors to University of Arkansas Foundation, Fayetteville, Ark.

Filed Apr. 27, 1979, Ser. No. 33,772
Int. Cl.[2] C12P *7/10*
U.S. Cl. 435—165 6 Claims

1. A method of recycling the endoglucanase (E.C.3.2.1.4) and cellobiohydrolase (E.C.3.2.1.91) portions of activity of cellulase enzyme which had been used as the cellulose hydrolyzing enzyme in a simultaneous saccharification-fermentation reaction of cellulose-to-ethanol by:

(1) separating the liquid fraction from the reaction mixture;

(2) contacting this enzyme and alcohol-containing liquid fraction with a cellulose-containing solid which is useful for the simultaneous saccharification-fermentation reac-

tion at between about pH 5 to about pH 8 and at above an ionic strength of 0.05 M to adsorb the enzymes thereupon;
(3) separating the solid fraction containing the adsorbed enzymes; and
(4) using the solid enzyme-cellulose combination as a portion of the feed to a further simultaneous saccharification-fermentation reaction.

4,220,722

METHOD FOR CONJUGATING TO POLYAMINO COMPOUNDS EMPLOYING HALOACYL GROUPS AND COMPOSITIONS PREPARED THEREBY

Gerald L. Rowley, San Jose; Danton Leung, Campbell, and Prithiphal Singh, Santa Clara, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed Feb. 10, 1978, Ser. No. 876,772
Int. Cl.[2] C12N *9/96*
U.S. Cl. 435—188 **14 Claims**

1. A method for covalently linking a poly(amino acid) compound being substantially free of active mercapto groups and having a plurality of amino functionalities to a mercapto compound, which comprises:

covalently linking at least one α-bromoacetyl containing compound to said poly(amino acid) through a non-oxocarbonyl group, including the nitrogen and sulfur analogs thereof, to form amide linkages or the nitrogen or sulfur analogs respectively, by combining said α-bromoacetyl containing compound with said poly(amino acid) in an inert polar solvent at a pH in the range of about 6.5 to 9 at a temperature in the range of about −5° to 40° C. to provide an α-bromoacetyl functionalized poly(amino acid); and

combining said α-bromoacetyl functionalized poly(amino acid) compound with said mercapto compound under mild conditions in a polar medium at a pH of about 6.5 to 8.5 to form a thioether by displacement of said bromo with the sulfur of said mercapto.

4,220,723

ENZYMATIC TREATMENT OF PROTEINACEOUS ANIMAL WASTE PRODUCTS

Zdenek Eckmayer, Weinheim; Alexander Berg, Hirschberg; Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,115
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1977, 2756739; Oct. 2, 1978, 2842918
Int. Cl.[2] C14C *1/00*; A23J *1/06*
U.S. Cl. 435—265 **10 Claims**

1. A method for converting a substrate selected from the group consisting of blood, bone waste, and meat scraps into useful water-soluble hydrolysis products dissolved in water, which method consists essentially of treating such a substrate with an hydrolysis medium consisting essentially of water, a proteinase, and urea, said medium having a pH in a region in which the proteinase displays sufficient activity.

4,220,724

METHOD FOR TREATING RAW MATERIALS CONTAINING COLLAGEN

Alexander Berg, Hirschberg; Zdeněk Eckmayer, Weinheim; Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,085
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813075
Int. Cl.[2] C07G *7/00*
U.S. Cl. 435—273 **6 Claims**

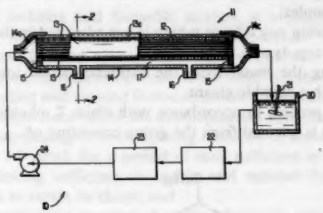
1. A method for conditioning a collagen-containing substrate to adapt it to a subsequent hot-water extraction of collagen and collagen degradation products therefrom, said substrate being selected from the group consisting of ossein, prepared fresh, limed, and salted hides and prepared limed, dry, and salted splits, said prepared hides and splits being dehaired prior to conditioning, which method consists essentially of incubating said substrate in an aqueous bath consisting essentially of water, a neutral or alkaline protease, and urea, guanidine, or an acid addition salt of guanidine, said bath having a pH between 6.5 and 13, and then inactivating said protease when the substrate is adaptable to hot-water extraction.

4,220,725

CAPILLARY CELL CULTURE DEVICE

Richard A. Knazek, and Pietro M. Gullino, both of Bethesda, Md., assignors to United States of America, Washington, D.C.

Continuation-in-part of Ser. No. 736,451, Oct. 28, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,853
Int. Cl.[2] C12M *3/04*
U.S. Cl. 435—285 **11 Claims**



1. A cell culture unit for the formation and maintenance of solid tissues in vitro comprising:

(a) shell means having spaced end portions and defining an elongated chamber therebetween;

(b) capillary means simulating a vascular network within said chamber, said capillary means including a multiplicity of individual capillaries extending in substantially parallel relationship to each other within said shell means, at least some of said capillaries having walls which are selectively permeable only to nutrients and/or cell products of up to a molecular weight of 100,000 and at least some of said capillaries having walls which are permeable only to gases;

(c) an envelope of porous sheet material surrounding said capillary means within said chamber, said chamber being divided by said envelope into an intra-envelope space within said envelope and an extra-envelope space outside said envelope, said intra-envelope space and said extra-envelope space communicating with each other only through the walls of said envelope, said intra-envelope space being divided by the walls of said capillaries into an intra-capillary space and an extra-capillary space communicating with each other only through the walls of said capillaries;

(d) means communicating with said intra-capillary space for passing perfusate therethrough; and

(e) means communicating with said extra-capillary space for seeding cells and/or retrieving cells or cell products therefrom.

4,220,726

IMPREGNATED RESINS FOR EXTRACTION OF METALS AND PROCESSES OF PRODUCTION AND USE THEREOF

Abraham Warshawsky, Rehovot, Israel, assignor to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Jul. 21, 1977, Ser. No. 817,807
Claims priority, application Israel, Jul. 25, 1976, 50120
Int. Cl.[2] B01D *15/08;* B01J *8/06;* C08J *9/40*
U.S. Cl. 521—55 17 Claims

1. A process for the production of an impregnated resin metal ion extraction agent, comprising:

impregnating a macroporous, hydrophobic polystyrene polymer or copolymer with a hydrophobic, metal ion specific extractant in the presence of a diluent for the extractant;

removing any diluent which is not adsorbed by the polymer or copolymer;

contacting the product with a solution containing a metal ion for which said extractant is specific to form an extractant-metal ion complex; and

eluting the metal from the extractant-metal ion complex with a suitable eluant.

7. A process for the production of an impregnated resin metal ion extraction agent, comprising:

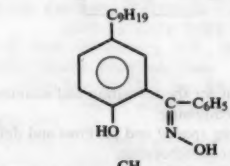
forming a complex of a metal ion specific extractant and a metal ion for which said extractant is specific in the present of a diluent for the extractant;

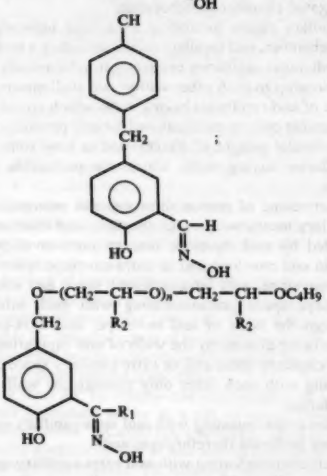
impregnating a macroporous, hydrophobic polystyrene polymer or copolymer with said diluent containing said complex;

removing any diluent which is not adsorbed in the polymer or copolymer; and

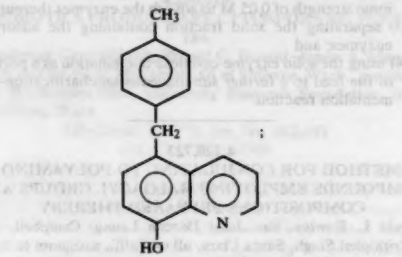
eluting the metal from the extractant-metal ion complex with a suitable eluant.

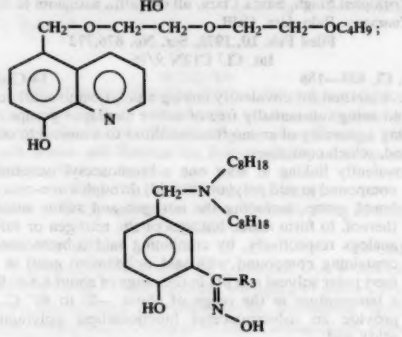
8. A process in accordance with claim 7 wherein said extractant is selected from the group consisting of:





wherein R_1=H or CH_3, R_2=H or CH_3 and n=1-9;





wherein R_3=H or CH_3;

di-(2-ethylhexyl) phosphoric acid;

di-(hexyldioxyethylene) phosphoric acid;

tributylphosphate; and

tri-(hexyldioxyethylene) phosphate.

11. An impregnated resin metal ion extraction agent comprising a macroporous polymer or copolymer of polystyrene having a polymeric backbone rendered hydrophilic by incorporation therein of oxyalkylene units, and a metal ion specific extractant supported thereby.

4,220,727

METHOD OF MOLDING POLYURETHANES HAVING MOLD RELEASE PROPERTIES

Robert E. Godlewski, Mahopac, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 726,215, Sep. 24, 1976, Pat. No. 4,111,861.
This application Jul. 12, 1978, Ser. No. 923,895
Int. Cl.[2] C08G *18/14, 18/08*
U.S. Cl. 521—110 23 Claims

1. A method for producing a polyurethane elastomer which comprises forming in a mold cavity having metal walls and curing a reaction mixture containing:

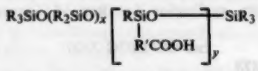
(a) a polyol,

(b) an organic polyisocyanate in an amount that provides from 0.8 to 1.3 isocyanato groups per active-hydrogen in the reaction mixture,

(c) a catalytic amount of catalyst for curing of the reaction mixture to produce the elastomer, and

(d) a mold release additive that is selected from the group consisting of:

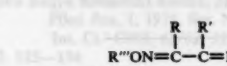
(I) carboxyalkylsiloxanes of the formula:



wherein R is a monovalent hydrocarbon radical, R′ is a divalent hydrocarbon radical containing up to 18 carbon

atoms which separates the carboxy group from the silicon atom by at least two carbon atoms, x is an integer between 30 and 100 and y is an integer between 5 and 20 with the proviso that the acid number of the siloxane be between about 50 and about 300,

(II) an aliphatic glyoxime of the formula:



wherein R and R' are the same or different alkyl groups containing between 1 and about 20 carbon atoms per group, and wherein R" and R"' are hydrogen or alkyl radical containing between 1 and about 15 carbon atoms per group, and

(III) an aryl modified aliphatic quaternary ammonium salt containing between about 15 and about 50 carbon atoms per molecule,

said reaction mixture containing (d) in an amount effective to impart to said elastomer the property of self-release from the walls of said mold cavity.

4,220,728

PROCESS OF REACTING ISOCYANATES WITH ACTIVE HYDROGEN CONTAINING COMPOUNDS USING SULFONIUM ZWITTERIONS AS INITIATORS

Jiri Kresta, Detroit, Mich., and Chen S. Shen, Strongsville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 695,897, Jun. 14, 1976, Pat. No. 4,111,914. This application Mar. 27, 1978, Ser. No. 890,153

Int. Cl.[2] C08G *18/06, 18/14, 18/16*

U.S. Cl. 521—121 **23 Claims**

1. A process for reacting an organic isocyanate with an active hydrogen compound, which comprises contacting the reactants with an ar-sulfonium areneoxide present in an amount and under conditions sufficient to initiate the reaction of said reactants.

4,220,729

FLAME-RETARDANT ISOCYANATE-BASED FOAMS AND METHOD OF PRODUCING THE SAME

Shinzi Uchida, Yokohama; Takashi Yokoyama, Tokyo, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 14, 1977, Ser. No. 815,661

Int. Cl.[2] C08G *18/14, 18/22, 18/58*

U.S. Cl. 521—124 **50 Claims**

1. In a method of producing foams by utilizing the reactivity of isocyanate groups comprising the step of reacting an organic polyisocyanate in the presence of a foaming agent and, optionally, at least one member selected from the group consisting of polyols, polyepoxides, polycarboxylic acids, acid anhydrides and other compounds capable of reacting with the isocyanate groups and, if necessary, a catalyst, a foam stabilizer and other additives, the improvement wherein at least one organic amine-metal complex soluble in the liquid raw material and containing a metal selected from the group consisting of copper, nickel, lead, cobalt, manganese, and chromium is added to the reaction system in an amount of 0.5 to 30 weight % based on the total weight of the raw materials used for preparation of foams.

4,220,730

CROSSLINKED CHLORINATED POLYETHYLENE FOAM

Brenton S. Coyne, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 784,992, Apr. 6, 1977, abandoned, which is a division of Ser. No. 713,010, Aug. 9, 1976, Pat. No. 4,146,598. This application Oct. 16, 1978, Ser. No. 951,545

Int. Cl.[2] C08J *9/06*

U.S. Cl. 521—143 **7 Claims**

1. A crosslinked, soft, flexible closed-cell suspension chlorinated high density polyethylene foam derived from a chlorinated high density polyethylene having about 25 to about 48 percent chlorine and a flexural modulus of less than about 15,000 psi as determined by ASTM Test No. 790, Method 1, Procedure A, said foam having a cell size of from about 0.05 to about 2 mm, a density of from about 2.5 to about 50 pcf, a tensile strength of from about 30 to about 600 psi, and a tensile elongation of from about 200 to about 500 percent and a flexural modulus from about 500 to about 6,000 psi, said foam being prepared by a process comprising

(a) preparing a foamable mixture consisting of the product obtained by mixing a high density suspension chlorinated polyethylene containing from about 25 to about 48 percent of chemically combined chlorine and having a flexural modulus at 25° C. of less than about 15,000 psi as determined by ASTM Test No. 790, Method 1, Procedure A, with a thermally decomposable chemical foaming agent;

(b) melt molding said foamable mixture at a temperature below that of the decomposition temperature of said chemical foaming agent, into a molded foamable article having a thickness of between about 0.025" to about 0.4";

(c) subjecting said molded formable article while maintained at a temperature below the decomposition temperature of said foaming agent to an ionizing radiation of about 2.5 to about 7.5 mrad, for a period of time sufficient to impart crosslinking sufficient to enable said molded foamable article to retain its shape; and

(d) contacting the crosslinked molded foamable article, in a substantially oxygen-free environment with a heat transfer medium maintained at a temperature between about 150° C. and about 350° C. for a period of time sufficient to form the desired flexible product.

4,220,731

PROCESS FOR THE PREPARATION OF CROSSLINKED HIGH POLYMERS

Paul Zuppinger, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 7, 1978, Ser. No. 913,420

Claims priority, application Switzerland, Jun. 14, 1977, 7296/77

Int. Cl.[2] C08L *63/00;* C08G *18/58*

U.S. Cl. 521—156 **12 Claims**

1. A process for the preparation of a crosslinked polymer which comprises reacting (a) a liquid epoxide compound containing at least two epoxide groups in the molecule, with (b) a polyisocyanate in such amounts that there are present 0.1 to 2.0 isocyanate groups per epoxide group; in the presence of 0.2 to 0.5% by weight of (a) plus (b) of a curing catalyst which is a complex compound of BF_3 with a member selected from the group consisting of tetrahydropyran and tetrahydrofuran and in the presence of (d) 0.0001 to 0.5% by weight of (a) plus (b) of a curing accelerator which is a compound of a metal selected from the group consisting of Sn, Zn and Fe, which is soluble in (a) and (b), at a temperature between room temperature and 250° C. wherein said process is conducted without the addition of external heat.

4,220,732

MICROCELLULAR POLYURETHANE FOAMS

Robert L. McBrayer, Lincoln Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 22, 1978, Ser. No. 972,641
Int. Cl.[2] C08G 18/14
U.S. Cl. 521—167 4 Claims

1. Polyurethane foam made from the reaction products of at least one polyoxyalkylene ether polyol having a hydroxyl functionality of at least two with at least one organic polyisocyanate in the presence of a blowing agent with about 0.2 to about 40 percent by weight based on the polyol of a chain extender comprising from about 1 percent to about 80 percent by weight of phenyldiethanolamine and from about 20 percent to about 99 percent by weight of 1,4-butane diol.

4,220,733

THERMALLY STABLE, FLAME-RETARDANT POLYMERS

Richard H. Jones, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 1, 1979, Ser. No. 35,098
Int. Cl.[2] C08L 77/00
U.S. Cl. 525—66 9 Claims

1. A flame retardant resin consisting essentially of

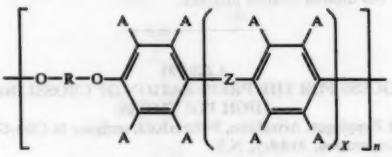
(a) a 98:2 to 60:40 blend by weight of at least one polyamide of film-forming molecular weight and at least one polyolefin of film-forming molecular weight that is either

(i) an adduct of an unsaturated carboxylic dianhydride and a hydrocarbon polymer having a saturated backbone chain and unsaturated hydrocarbon side chains, which contains between about 0.5 and 9 percent, preferably 1–4 percent, by weight of adduct, of the dianhydride, or

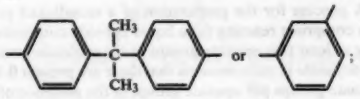
(ii) an ionic copolymer of an α-olefin and an α,β-ethylenically unsaturated carboxylic acid in which the acid monomer content of the copolymer is between about 0.2 and 25 mol percent based on the copolymer, in which at least 10 percent of the carboxyl groups of the acid are neutralized with metal ions, or

(iii) a mixture of an unsubstituted polyolefin and either the adduct defined in (i) or the ionic copolymer defined in (ii),

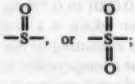
(b) between about 1 and 30 percent by weight of resin of an oligomer represented by the formula



wherein R is a divalent aryl-containing organic group of between about 6 and 15 carbon atoms, and preferably is



X is zero or 1; Z is oxygen, sulfur,



each A is independently hydrogen or bromine with the proviso that when X is 1, at least six of the A groups are bromine, and when X is zero, all of the A groups are bromine; and n is a cardinal number ϕ between about 2 and about 20; and

(c) between about 1–15 percent, preferably 3–10 percent, by weight of resin, antimony oxide.

4,220,734

IMPACT AND WEATHER RESISTANT COMPOSITE OF POLYVINYLCHLORIDE AND ACRYLIC MODIFIER

Takumi Kosugi; Shigeki Yasunaga, both of Kobe; Yutaka Tanaka, Akashi, and Yoshihiko Hashimoto, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 25, 1973, Ser. No. 363,984
Claims priority, application Japan, May 26, 1972, 47-52737
Int. Cl.[3] C08L 51/00
U.S. Cl. 525—85 20 Claims

1. Method of producing a thermoplastic resin composition comprising the steps of

(A) preparing an aqueous elastomeric dispersion from alkyl acrylate having alkyl group with 2 to 8 carbon atoms or from a mixture of at least 80% by weight alkyl acrylate and 20% by weight or less of a monovinylidene compound, and 0.1 to 8% by weight of a multi-functional cross-linking agent;

(B) graft polymerizing to said elastomeric dispersion, 20 to 70 parts by weight of a monomer mixture consisting essentially of alkyl methacrylate or a mixture of less than 80% by weight aromatic vinyl compound and remainder alkyl methacrylate, the particles of said dispersion being agglomerated before the graft polymerization; and

(C) blending 3 to 50 parts by weight of the resulting graft polymer and 97 to 50 parts by weight of polyvinyl chloride or a copolymer of at least 70% by weight vinyl chloride and 30% by weight or less of a monovinylidene compound copolymerizable therewith.

4,220,735

MODIFIED POLYESTER COMPOSITIONS

Ronald L. Dieck, and Allen D. Wambach, both of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 18, 1978, Ser. No. 970,189
Int. Cl.[2] C08L 67/02, 53/02, 69/00
U.S. Cl. 525—90 11 Claims

1. A thermoplastic composition comprising:

(a) a polyester composition comprising:

(i) a blend of a poly(1,4-butylene terephthalate) resin and a poly(ethylene terephthalate) resin;

(ii) a block copolyester of poly(1,4-butylene terephthalate) and an aromatic/aliphatic or aliphatic polyester;

(iii) a blend of (ii) and a poly(ethylene terephthalate) resin; or

(iv) a blend of (ii) and a poly(1,4-butylene terephthalate) resin;

(b) an impact modifier therefor comprising a combination of:

(i) a selectively hydrogenated monoalkenyl arene-diene block copolymer resin; and

(ii) an aromatic polycarbonate resin, in an amount of from at least about 1.0 up to 60 parts per 100 parts by weight of (a) and (b) together.

4,220,736

AGRICULTURAL COVERING FILM OR SHEET AND METHOD FOR THERMAL INSULATION FROM A BLEND OF AN OLEFIN RESIN AND AN ACETAL RESIN

Yoshiaki Kodera, Kusatsu; Kiyoyuki Watanabe, Jyoyo, and Takayuki Kusu, Minoo, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Jun. 1, 1978, Ser. No. 911,956
Int. Cl.[2] C08L *61/02, 31/04, 23/06*
U.S. Cl. 525—154 4 Claims

1. A resin composition in the form of a covering film or sheet consisting essentially of (A) 100 parts by weight of a thermoplastic olefinic resin selected from the group consisting of polyethylene, an ethylene/vinyl acetate copolymer, and mixtures of these and (B) about 1 to about 20 parts by weight of an acetal resin having a degree of polymerization of about 500 to about 3,500 and selected from the group consisting of polyoxymethylene polymer and polyoxymethylene copolymer containing up to about 3% by weight of comonomer.

4,220,737

PAINT COMPOSITION

Ryuji Kita, Yokohama, Japan, assignor to Nippon Zion Co. Ltd., Tokyo, Japan

Filed Aug. 21, 1978, Ser. No. 935,157
Claims priority, application Japan, Aug. 22, 1977, 52-100281
Int. Cl.[2] C08L *11/00, 15/02, 23/28*
U.S. Cl. 525—214 8 Claims

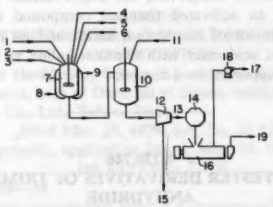
1. An air drying paint composition comprising a chlorinated polymer selected from the group consisting of chlorinated polyisoprene, chlorinated polybutadiene, chlorinated polyethylene and chlorinated polypropylene as at least one ingredient of a binder, said composition further comprising 5 to 100 parts by weight, per 100 parts by weight of the chlorinated polymer, of a cyclopentadiene resin having a softening point of 50° to 160° C. prepared by heat polymerization of 50 to 100% by weight of a cyclopentadiene monomer and 50 to 0% by weight of a comonomer copolymerizable with it.

4,220,738

PROCESS FOR PRODUCING BLOCK COPOLYMER FROM CONJUGATED DIENE AND VINYL AROMATIC

Tamotsu Miki; Shizuo Narisawa; Hideki Horiike, and Ichiro Ichikawa, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 460,550, Apr. 12, 1974, abandoned.
This application Mar. 28, 1978, Ser. No. 890,942
Claims priority, application Japan, Apr. 19, 1973, 48-44806; May 4, 1973, 48-50103; Dec. 15, 1973, 48-140482
Int. Cl.[2] C08F *297/04, 293/00*
U.S. Cl. 525—242 21 Claims



1. A process for producing a clear block copolymer resin according to a suspension polymerization process which comprises

block copolymerizing a mixture of 70 to 90 parts by weight of an aromatic vinyl compound monomer and 10 to 30 parts by weight of a conjugated diene monomer in two stages using an organolithium compound as a polymerization initiator, characterized by

using an aliphatic hydrocarbon selected from the group consisting of propane, butane, pentane, hexane, heptane, nonane, decane, and mixtures thereof as a solvent,

adding, in the first polymerization stage, a mixture of 10 to 60 parts by weight of the aromatic vinyl compound monomer out of the total amount thereof and the total amount of the conjugated diene monomer to the reaction system to polymerize all the monomers substantially for the formation of an elastomeric copolymer block, and

continuously adding, subsequently in the second polymerization stage, all the remaining aromatic vinyl compound monomer to the reaction system at a polymerization rate that the added monomer is substantially polymerized at once and that no unreacted monomer is substantially present in the reaction system, and continuing the polymerization to polymerize all the monomer substantially for the formation of a non-elastomeric block, said polymerization being carried out at a temperature of from about 20° C. to about 80° C.

4,220,739

METHOD FOR SULFONATING ORGANIC MATERIALS

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1978, Ser. No. 928,666
Int. Cl.[2] C08F *8/34, 8/36*
U.S. Cl. 525—344 11 Claims

1. A process for sulfonating organic compounds which comprises contacting a sulfonatable organic compound which have hydrogen atoms bonded to carbon atoms which are replaceable by sulfonic acid groups with an essentially dry gaseous mixture comprising sulfur trioxide and suitably active halogen selected from the group consisting of fluorine, bromine, chlorine or mixtures thereof which inherently form interhalogen compounds, wherein the amount of sulfur trioxide is sufficient to provide a desired degree of sulfonation and the amount of halogen is sufficient to accelerate the rate of sulfonation at least 10 percent relative to the rate of sulfonation achieved by using sulfur trioxide in the absence of halogen.

4,220,740

PROCESS FOR PRODUCING STABILIZED POLYOXYMETHYLENE

Kazuhiko Matsuzaki, and Junzo Masamoto, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 20, 1979, Ser. No. 31,913
Claims priority, application Japan, Apr. 21, 1978, 53-46510
Int. Cl.[2] C08G *2/30*
U.S. Cl. 525—398 11 Claims

1. A process for producing a stabilized polyoxymethylene characterized by reacting polyoxymethylene having a number average molecular weight of 10,000 or more with 1,3-dioxepane in the presence of a Lewis acid in an organic medium.

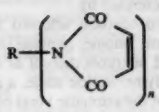
4,220,741

CURABLE MIXTURES BASED ON MALEIMIDE PREPOLYMERS AND ACETONE-ANIL

Alfred Renner, Münchenstein, and Sheik A. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 783,571, Apr. 1, 1977, Pat. No. 4,160,859.
This application Mar. 30, 1979, Ser. No. 25,309
Claims priority, application Switzerland, Apr. 8, 1976, 4441/76
Int. Cl.[2] C08G *69/26, 73/10*
U.S. Cl. 525—422 6 Claims

1. A curable composition which consists essentially of (a) a maleimide prepolymer obtained by the reaction of a maleimide of formula I



(I)

wherein R denotes an n-valent aliphatic or aromatic radical and n denotes the number 2, with an aliphatic, cycloaliphatic or aromatic primary diamine containing 2 to 40 carbon atoms, whereby to 1 imido group equivalent is used 0.05 to 1 amino group equivalent; and (b) 2,2,4-trimethyl-1,2-dihydroquinoline, in such ratio that for 1 imido group equivalent is used 0.05 to 1 mole of 2,2,4-trimethyl-1,2-dihydroquinoline.

4,220,742

PROCESS FOR THE POLYMERIZATION OF ETHYLENE IN THE PRESENCE OF DIARYL GLYCOL ETHERS

Fritz Mietzsch, Cologne; Hans Rudolph, Krefeld; Heinrich Wolfers, Rheurdt, and Heinrich Alberts, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

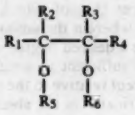
Filed Dec. 20, 1978, Ser. No. 971,391

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758719

Int. Cl.² C08F *10/02*

U.S. Cl. 526—209 **6 Claims**

1. A process for the preparation of an ethylene polymer wherein ethylene and optionally one or more α,β unsaturated comonomers are polymerised at a temperature of from 100° to 350° C. and under a pressure of from 600 to 3500 atmospheres in the presence of an initiator corresponding to the following general formula:



(I)

wherein

R_1 and R_3, which may be the same or different, each represents an aryl radical which may be substituted one or more times by C_1–C_4 alkyl, methoxy, chlorine or fluorine; and

R_2, R_4, R_5 and R_6, which may be the same or different either have the same meaning as R_1 and R_3 or each represents a C_1–C_6 alkyl radical or an aryl radical either of which may be substituted one or more times by C_1–C_4 alkyl, methoxy, chlorine or fluorine, a C_5–C_7 cycloalkyl radical or hydrogen.

4,220,743

PROCESS FOR AQUEOUS DISPERSION POLYMERIZATION OF VINYL HALIDE MONOMERS IN COATED REACTOR

Boris Englin, Chadstone, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Filed Mar. 2, 1978, Ser. No. 882,926

Claims priority, application Australia, Mar. 8, 1977, 9324/77

Int. Cl.² C08F *2/20*

U.S. Cl. 526—62 **19 Claims**

1. A process for the polymerization of vinyl halide monomers in aqueous dispersion wherein polymerization is carried out in a reactor having deposited on the interior surfaces thereof a coating composition comprising a product formed by reacting at a temperature below 110° C. at least one aliphatic amine compound chosen from the group consisting of monoalkylamines, dialkylamines and polyamino aliphatic amines with at least one aromatic amine compound selected from the group consisting of primary and secondary aromatic amines and polyamino aromatic amines and with at least one oxy-group substituted aromatic compound chosen from the group consisting of hydroquinone, phenol, meta and para substituted phenols, cresols, p-tertiary-butylcatechol, picric acid, pyrogallol, salicylaldehyde, resorcinol, benzoquinone, substituted benzoquinone and napthoquinone, the ratio of any one compound chosen to the total weight of compounds chosen being in the range of 1:100 to 3:4.

4,220,744

MASS POLYMERIZATION PROCESS

Laszlo Tulacs, and Hans Hiden, both of Graz, Austria, assignors to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Nov. 6, 1978, Ser. No. 957,855

Claims priority, application Austria, Nov. 17, 1977, 8196/77

Int. Cl.² C08F *218/16*

U.S. Cl. 526—86 **6 Claims**

1. A process for the bulk polymerization of acrylic monomers by free-radical polymerization comprising the steps of

(1) charging to a reaction vessel from about 5 to 15 percent by weight of an alpha,beta-unsaturated monomer which does not, under the conditions of the reaction, tend to the formation of homopolymers through free-radical polymerization and which is selected from the group consisting of fumaric acid and maleic acid alkyl esters having from 4 to 12 carbon atoms in the ester chain, and mixtures thereof;

(2) after step (1), adding to the reaction vessel about 95 to 85 percent by weight of an acrylic monomer which, under the conditions of the reaction, undergo free-radical polymerization blended with a free-radical initiator; and

(3) controlling addition step (2) in order that the acrylic component in the reaction kettle is present in the form of unreacted momomers in an amount of less than about 20 percent by weight during the course of the reaction.

4,220,745

PROCESS FOR POLYMERIZATION OF α-OLEFINS

Takao Tanaka; Tadashi Asanuma, both of Izumi; Tetsunosuke Shiomura, Takaishi, and Akira Ito, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 972,673

Claims priority, application Japan, Mar. 1, 1978, 53-22042; Jul. 3, 1978, 53-79825; Jul. 3, 1978, 53-79826

Int. Cl.² C08F *4/02, 10/06*

U.S. Cl. 526—125 **14 Claims**

1. In a process for the stereospecific polymerization of α-olefins with use of a catalyst comprising a titanium compound supported on a carrier, an organoaluminum compound and an electron donative compound, the improvement which comprises using an activated titanium compound obtained by contact treatment of magnesium halide and an aromatic orthocarboxylic acid ester with titanium halide as the titanium compound supported on a carrier.

4,220,746

4-PEROXYESTER DERIVATIVES OF TRIMELLITIC ANHYDRIDE

Imre Puskas, Glen Ellyn, and Ellis K. Fields, River Forest, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

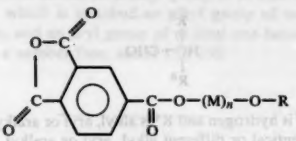
Filed May 22, 1978, Ser. No. 908,111

Int. Cl.² C07D *307/89, 405/14*

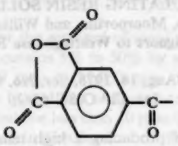
U.S. Cl. 526—265 **13 Claims**

1. 4-Alkyl pertrimellitate anhydrides.

4. A polymer of the structural formula



wherein M is a divalent monomer radical of a monomer compound selected from the group consisting of styrene, methyl methacrylate and 4-vinylpyridine, n is an integer from 2 to 10,000, and R is selected from the group consisting of a hydrogen moiety, an alkyl moiety of from one to ten carbon atoms and the moiety



6. A process for preparing 4-alkyl pertrimellitate anhydrides which consists essentially of esterifying a trimellitic anhydride monoacid halide with an alkyl hydroperoxide which comprises maintaining the reactant mixture at a temperature sufficiently low to prevent side reactions, in the presence of a tertiary amine and in the presence of a hydrocarbon solvent wherein the alkyl moiety of said alkyl hydroperoxide is selected from the group consisting of primary, secondary and tertiary alkyl moieties of one to 10 carbon atoms in the carbon chain.

4,220,747

CRYSTALLINE DIACETYLENE POLYMERS

Anthony F. Preziosi, Ledgewood; Kwok C. Yee, Randolph, and Ray H. Baughman, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 578,246, May 16, 1975, abandoned. This application Jun. 28, 1976, Ser. No. 700,626

Int. Cl.[2] **C08F** *38/00*

U.S. Cl. 526—285 **7 Claims**

1. A liquid phase processable crystalline diacetylene polymer obtains by 1,4-addition solid state polymerization of a diacetylene monomer having a formula of the group consisting of $[R_1NHOCO(CH_2)_3—C{\equiv}C—]_2$ and $[R_2NHOCO(CH_2)_4—C{\equiv}C—]_2$; wherein R_1 is of the group consisting of CH_3CH_2, C_6H_5, and $C_{10}H_7$ and R_2 is of the group consisting of CH_3, CH_3CH_2, and C_6H_5.

4,220,748

ROOM TEMPERATURE CURABLE POLYSILOXANE COMPOSITION

Mitsuyoshi Hashimoto, Ojima; Kiyoshi Hosokawa, and Bunjirou Murai, both of Ohta, all of Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

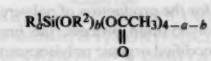
Filed Mar. 20, 1979, Ser. No. 22,119

Claims priority, application Japan, Mar. 30, 1978, 53-36982

Int. Cl.[2] **C08G** *77/06*

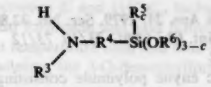
U.S. Cl. 528—18 **17 Claims**

1. A room temperature curable polyorganosiloxane composition consisting essentially of (A) 100 parts by weight of a silanol-terminated polydiorganosiloxane having a viscosity of 500 to 200,000 cSt measured at 25° C., (B) 0.5 to 25 parts by weight of an acetoxy group-containing organic silicon compound selected from the group consisting of acetoxy group-containing silanes having the following formula and partially hydrolyzed products thereof:



wherein R^1 is a monovalent substituted or unsubstituted hydrocarbon group, R^2 is a monovalent group selected from the group consisting of alkyl groups and alkoxyalkyl groups, a is a number of 0 or 1, and b is a number of 0 or 1,

and (C) 0.01 to 10 parts by weight of the reaction product of the reaction between (1) an aminoalkyl group-containing organic silicon compound selected from the group consisting of aminoalkyl group-containing silanes having the following formula and partially hydrolyzed products thereof:



wherein R^3 is hydrogen or a monovalent substituted or unsubstituted hydrocarbon group, R^4 is a divalent hydrocarbon group, R^5 is a monovalent substituted or unsubstituted hydrocarbon group, R^6 is a monovalent group selected from the group consisting of alkyl groups and alkoxyalkyl groups, and c is a number of 0 or 1,

and (2) an anhydride of a polycarboxylic acid.

4,220,749

PROCESS FOR THE PRODUCTION OF MODIFIED POLYISOCYANATES

Wolfgang Reichmann, Duesseldorf; Klaus König, and Heinz-Georg Nordmann, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,765

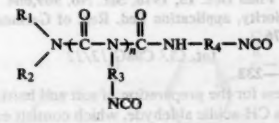
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730513

Int. Cl.[2] **C07C** *27/24;* **C08G** *18/72*

U.S. Cl. 528—44 **14 Claims**

1. A process for the production of modified organic polyisocyanates containing triuret or higher polyuret groups, wherein secondary monoamines are reacted with excess quantities of organic diisocyanates with formation of triuret or higher polyuret groups and with incorporation into the resulting product of the residue of the amine which is inert with respect to the reaction, the reaction being conducted in the presence of a proton-eliminating acid catalyst which is capable of reacting with isocyanate groups to form a mixed carbamic acid anhydride.

5. Compounds corresponding to the following general formula:



wherein

R_1 and R_2, which may be the same or different, each represents an aliphatic hydrocarbon radical containing from 1 to 20 carbon atoms or a cycloaliphatic hydrocarbon radical containing from 4 to 20 carbon atoms, or the two radicals together with the nitrogen atom may form a 5- or 6-membered heterocyclic ring optionally containing further hetero atoms selected from the group consisting of nitrogen sulfur and oxygen;

R_3 and R_4, which may be the same or different, each represents an aliphatic or cycloaliphatic hydrocarbon radical containing from 4 to 20 carbon atoms; and

n represents a number of from about 2 to 8.

7. In a process for the production of polyurethane plastics by the isocyanate-polyaddition process, the improvement comprising reacting modified organic polyisocyanates produced by the process of claim 1 with active hydrogen-containing compounds.

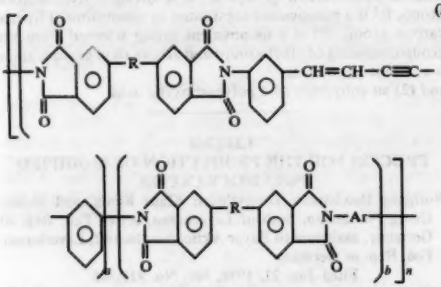
4,220,750

THERMALLY STABLE AROMATIC ENYNE POLYIMIDES

Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 24, 1979, Ser. No. 32,809
Int. Cl.[2] C08G *73/10, 73/12*
U.S. Cl. 528—172 **7 Claims**

1. An aromatic enyne polyimide consisting essentially of recurring units having the following structural formula:



(I)

wherein Ar is a divalent aromatic radical; R is sulfur, sulfonyl, carbonyl or a divalent aromatic, aliphatic or perfluoroaliphatic radical; a is equal to 0.05 to 1, b is equal to zero to 0.95 and the sum of a and b is equal to 1; and n is an integer ranging from about 1 to 100.

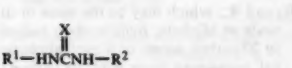
4,220,751

PREPARATION OF SOFT AND HARD RESINS, AND THEIR USE

Harro Petersen, Frankenthal; Kurt Fischer, Ludwigshafen; Hans Klug, Mutterstadt, and Werner Trimborn, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,664
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757176
Int. Cl.[2] C08G *12/12*
U.S. Cl. 528—232 **9 Claims**

1. A process for the preparation of soft and hard resins from an urea and a CH-acidic aldehyde, which consists essentially of reacting an urea of the formula (I)



(I)

where X is oxygen or sulfur and R^1 and R^2 are hydrogen, identical or different alkyl of 1 to 18 carbon atoms, aryl of 6 to 9 carbon atoms or aralkyl of 7 to 9 carbon atoms or may be an alkyleneurea radical, where alkylene is of 1 to 9 carbon atoms, with at least 2 moles of a CH-acidic aldehyde of the formula (II)

(II)

where R^3 is hydrogen and R^4 is alkyl, aryl or aralkyl, or R^3 and R^4 are identical or different alkyl, aryl or aralkyl, in the presence of a strong acid, to give a condensation product, and thereafter treating the product with an alkali metal alcoholate in an anhydrous medium.

4,220,752

METHOD OF MAKING A HIGH TEMPERATURE CAPABILITY WATER SOLUBLE POLYESTER INSULATING RESIN SOLUTION

Daniel R. Sassano, Monroeville, and William H. Fink, Manor, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1978, Ser. No. 933,334
Int. Cl.[2] C08G *63/20*
U.S. Cl. 528—289 **3 Claims**

1. A method of producing a high temperature capability polyester resinous solution which comprises admixing and esterifying a mixture consisting essentially of:

(a) 10 moles of an organic, aliphatic dihydric alcohol selected from the group consisting of neopentyl glycol, 1,2-butane diol, 1,4-butane diol and mixtures thereof;

(b) about 3 to 8 moles of an organic, polycarboxylic acid selected from aromatic tricarboxylic acid or mixtures thereof with carbocyclic dicarboxylic acid, wherein the mole ratio of tricarboxylic acid:dicarboxylic acid is from about 1:0 to 1;

(c) about 1 to 4 moles of an organic, aliphatic dicarboxylic acid selected from saturated aliphatic dicarboxylic acid or mixtures thereof with unsaturated aliphatic dicarboxylic acid, wherein the mole ratio of saturated aliphatic dicarboxylic acid:unsaturated aliphatic dicarboxylic acid is from about 1:0 to 0.2;

(d) about 0.5 to 2.0 moles of tris (2 hydroxy alkyl) isocyanurate, where alkyl contains from 2 to 6 carbon atoms; and

(e) an effective amount of a catalyst to activate the isocyanurate; and then adding an amount of organic solvent to provide a resinous solution, wherein the esterification reaction is continued until the acid value drops to between 35 to 45, and wherein the mole ratio of OH/COOH=1.1 to 2.0.

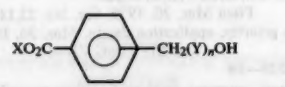
4,220,753

ALKYL ALKOXYMETHYLBENZOATES

Steven A. Cerefice, Naperville, and Edward E. Paschke, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 18, 1978, Ser. No. 970,223
Int. Cl.[2] C08G *63/06, 65/26;* C07C *65/13*
U.S. Cl. 528—302 **21 Claims**

1. Compositions of matter of the formula



wherein X is selected from the group consisting of hydrogen, an alkyl group of 1 to 24 carbon atoms and a hydroxyl alkyl group of 2 to 24 carbon atoms, and Y is selected from the group consisting of —OCHR'CHR"—, —OCH_2CHR'CHR"—, —OCH_2CHR'CH_2CHR"—, and —OCH_2CHR'CHR"CH_2—, wherein R' and R" are the same or different and are individually selected from the group consisting of H, an alkyl group of

one to six carbon atoms, an aralkyl group of at least one benzene ring to which is attached an alkyl group of one to six carbon atoms, and an aryl group of at least one benzene ring wherein n is a number from about 1 to 100.

4,220,754

PROCESS FOR THE PURIFICATION OF POLYVINYL CHLORIDE WITH OXIDIZING AGENTS

Martin L. Feldman, East Brunswick, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed May 25, 1976, Ser. No. 690,202
Int. Cl.[2] C08F *6/24, 6/14, 8/06*
U.S. Cl. 528—483 **9 Claims**

1. In the process for the removal of vinyl chloride from an aqueous slurry that contains 5% to 50% by weight of polyvinyl chloride and 100 ppm to 15,000 ppm of vinyl chloride wherein the slurry is heated at a temperature between 70° C. and 100° C. until it contains less than 10 ppm of vinyl chloride, the improvement wherein discoloration of the polyvinyl chloride is inhibited by contacting the polyvinyl chloride in the slurry with a water-soluble oxidizing agent during the heat treatment.

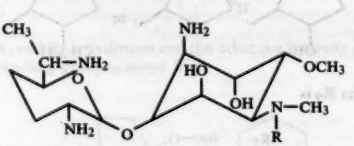
4,220,755

FORTIMICIN B DERIVATIVES AND PROCESS FOR PRODUCTION THEREOF

Moriyuki Sato, Machida, and Yasuki Mori, Kawasaki, both of Japan, assignors to Abbott Laboratories, Norta Chicago, Ill.

Filed Sep. 23, 1977, Ser. No. 836,229
Claims priority, application Japan, Sep. 23, 1976, 51-114306
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 R **51 Claims**

1. A compound of the formula:



wherein R represents a group selected from

and $—CH_2—R_2$, wherein R_1 represents an alkyl group having 2 to 8 carbon atoms an aminoalkyl group having 3 to 8 carbon atoms, a carbamoylamino-alkyl group having 3 to 9 carbon atoms or a hydroxyalkyl group having 1 to 5 carbon atoms, and R_2 represents an alkyl group having 1 to 8 carbon atoms, a hydroxylalkyl group having 1 to 5 carbon atoms, an aminoalkyl group having 1 to 8 carbon atoms, an N-alkylaminoalkyl group having 2 to 10 carbon atoms, an aminohydroxyalkyl group having 2 to 8 carbon atoms, an N-substituted aminoalkyl group (wherein the aminoalkyl group has 2 to 5 carbon atoms and the N-substituent is an aminoalkyl group having 1 to 5 carbon atoms) or an N-alkylaminohydroxyalkyl group having 2 to 8 carbon atoms, and the pharmaceutically acceptable non-toxic acid addition salts thereof.

4,220,756

METHOD OF PRODUCING 3-O-DEMETHYLFORTIMICIN B,4-N-ALKYLFORTIMICIN B DERIVATIVES AND RELATED AMINOGLYCOSIDE ANTIBIOTICS

John Kloss, and Alex M. Nadzan, both of Gurnee, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,239
Int. Cl.[2] A61K *71/31;* C07H *15/22*
U.S. Cl. 536—17 R **6 Claims**

1. A process of preparing 3-O-demethylfortimicin B or a 4-N-alkyl derivative thereof comprising the steps of reacting a fortimicin to be O-demethylated with a first portion of lithium in the presense of ethylenediamine, said lithium and ethylenediamine having first been reacted under an inert atmosphere at a temperature of between 8° and 116° C., inclusive, until a blue color appears, said fortimicin and said lithium solution being stirred at ambient temperature until said blue color disappears, and thereafter isolating the 3-O-demethylfortimicin from the reaction mixture.

4,220,757

PROCESS FOR THE PRODUCTION OF ALKALI METAL-CELLULOSE-SILICATES AND THEIR REACTION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed Apr. 12, 1979, Ser. No. 29,202
Int. Cl.[2] C08B *31/00*
U.S. Cl. 536—84 **6 Claims**

1. The process for the production of water-soluble alkali metal-cellulose-silicate condensation product by the following steps:

(a) mixing 3 parts by weight of a cellulose-containing plant with 1 to 2 parts by weight of an oxidated silicon compound and 2 to 5 parts by weight of an alkali metal hydroxide;

(b) heating the mixture at 150° C. to 220° C. while agitating for 5 to 60 minutes, thereby

(c) producing a water-soluble alkali metal-cellulose-silicate condensation product.

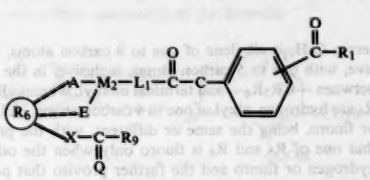
4,220,758

C_{1-4} ALKANOYLPHENYL-ESTERS OF 5-HYDROXY-PGI_1, Δ^4-PGI_1, AND 4-OXO-PGI_1 COMPOUNDS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 933,329, Aug. 14, 1978, Pat. No. 4,180,657. This application Jun. 14, 1979, Ser. No. 48,494
Int. Cl.[2] C07D *307/93, 311/94;*
U.S. Cl. 542—426 **25 Claims**

1. An acid ester of a prostacyclin analog of the formula



wherein A is (1) —O-(oxa) or, when E is $—CH_2—$, (2) $—CH_2—O—$, with $—CH_2$ bonded to (R_8)

wherein E is $—CH_2—$or $—CH_2CH_2—$,

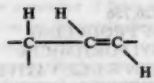
wherein L_1 is

(1) $—(CH_2)_n—$ wherein n is one to 5, inclusive,

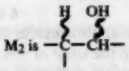
(2) $—(CH_2)_p—CF_2—$ wherein p is one 2, 3, or 4, or

(3) $—(CH_2)_v—CH=CH—$ wherein v is zero 1, 2, or 3,

when M_2 is

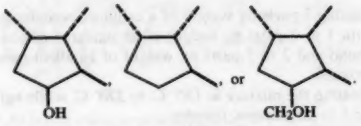


or L, is (1)—$(CH_2)_n$—wherein n is one to 5 inclusive,
(2)—$(CH_2)_p$—CF_2—wherein p is 2, 3 or 4, or
(3)—$(CH_2)_r$—CH=CH—wherein V is 1,2 or 3, and M_2 is

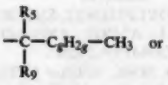


wherein ~ indicates attachment in cis or trans configuration
wherein Q is

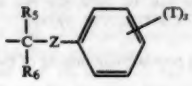
wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the —C(O)—R_1 group is in the 4-position,
wherein (R_8) is



and wherein R_9 is



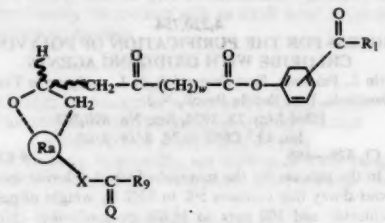
(1)



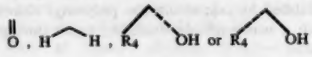
(2)

wherein C_9H_{2l} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different, and
wherein X is
(1) trans-CH=CH—
(2) cis-CH=CH—
(3) —C≡C— or
(4) —CH_2CH_2—.

24. An acid ester of a prostacyclin analog of the formula

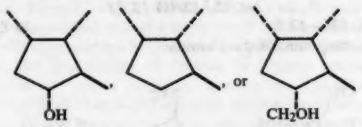


wherein Q is

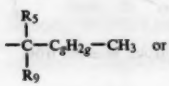


wherein R_4 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_1 is alkyl of one to 4 carbon atoms, inclusive, with the proviso that when R_1 is tert-butyl the

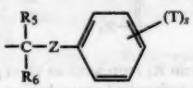
group is in the 4-position,
wherein (R_8) is



wherein R_9 is



(1)



(2)

wherein C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;

wherein T is alkyl of one to 4 carbon atoms; inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different,

wherein X is

(1) trans-CH=CH—

(2) cis-CH=CH—

(3) -C≡C— or

(4) —CH_2CH_2—,

wherein w is one, 2, or 3, and

wherein ~ indicates attachment in cis or trans configuration.

4,220,759

13,14-DEHYDRO-11-DEOXY-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

Carmelo Gandolfi; Renato Pellegata; Franco Faustini, and Angelo Fumagalli, all of Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

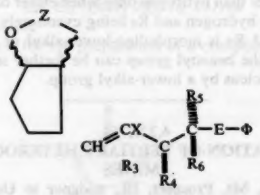
Division of Ser. No. 664,472, Mar. 8, 1976, Pat. No. 4,198,430. This application Jul. 13, 1979, Ser. No. 57,518

Claims priority, application Italy, Mar. 14, 1975, 21264 A/75

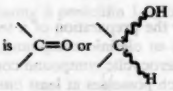
Int. Cl.³ C07D *307/77*

U.S. Cl. 542—426 **1 Claim**

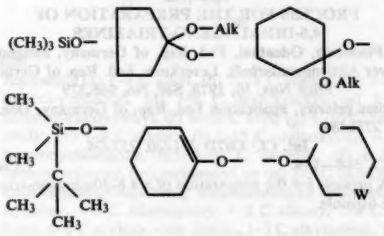
1. A compound of the formula



wherein:



one of R_3 and R_4 is hydrogen and the other is a hydroxy group or a protecting group selected from



wherein

W is —O— or —CH_2— and Alk is a lower alkyl group, or when Z is C=O, R_3 and R_4, taken together, may also be a oxo group, X is chlorine, bromine or iodine;

R_5 and R_6 are independently hydrogen, fluorine or C_1–C_4 alkyl, provided that when either R_5 or R_6 is alkyl the other is hydrogen or fluorine and when one of them is fluorine the other is C_1–C_4 alkyl;

E is —CH_2—$_n$ where n is an integer of 1 to 6 or —CH_2—$_{n1}$ — O—CH_2—$_{n2}$ where n_1, and n_2 are independently zero, 1, 2 or 3, Φ is methyl, cycloalkyl containing 3 to 7 ring carbon atoms optionally containing at least one ring oxygen or sulfur atom, phenyl, phenyl substituted by at least one of halogen, C_1–C_4 alkoxy, phenyl or trihalomethyl, provided that the chains bound to the C-8 and C-12 carbon atoms are in the trans configuration.

4,220,760

DIAMINO-1,3,5-TRIAZINYLSTILBENE COMPOUNDS AND PROCESS FOR PREPARING SAME

Rüdiger Erckel, Eppstein; Erwin Schmidt, Kelkheim; Helmut Eckes, Frankfurt am Main, and Güter Rösch, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

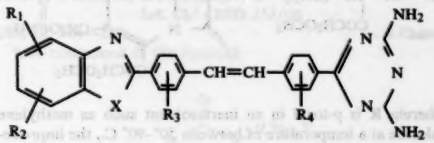
Filed Nov. 13, 1978, Ser. No. 959,521

Claims priority, application Switzerland, Nov. 16, 1977, 14005/77

Int. Cl.² C07D *463/10*

U.S. Cl. 542—460 **4 Claims**

1. Diamino-1,3,5-triazinylstilbene compounds of the formula



in which R_1 and R_2 may be identical or different and are each hydrogen, fluorine, chlorine, phenyl, alkyl, lower alkoxy, lower dialkylamino, lower trialkylammonium, acylamino, carboxy, cyano, carboxylic acid ester, carbonamido, nono- or dialkylcarbonamido, sulfo, sulfonic acid ester, sulfonamido, mono- or dialkylsulfonamido or two vicinal radicals R_1 and R_2 are together lower alkylene, a fused benzo ring or 1,3-dioxypropylene, R_3 and R_4 independent from one another are hydrogen, halogen, cyano, alkoxy having from 1 to 4 carbon atoms, sulfo, sulfonic acid ester, sulfonamido, mono- or dialkylsulfonamido and X is oxygen or sulfur.

4,220,761

7-[SUBSTITUTED OXIMINOACETAMIDO]-3-[HYDROXY ALKYLTETRAZOLO]CEPHALOSPORIN DERIVATIVES

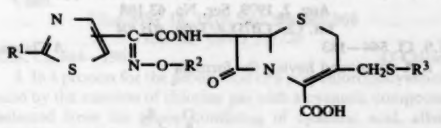
Takao Takaya, Kawanishi; Takashi Masugi, Kitamachi; Hisashi Takasugi, Kohamanishi, and Hiromu Kochi, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 12, 1978, Ser. No. 941,660

Int. Cl.² C07D *501/36*

U.S. Cl. 544—27 **8 Claims**

1. A syn isomer compound of the formula:



wherein

R^1 is amino or lower alkanoylamino,

R^2 is lower alkyl lower alkylthio(lower)alkyl, hydroxy(lower)alkyl, lower alkanoyloxy(lower)alkyl, lower alkenyl or lower alkynyl,

R^3 is tetrazolyl monosubstituted with hydroxy(lower)alkyl, and

its pharmaceutically acceptable salt.

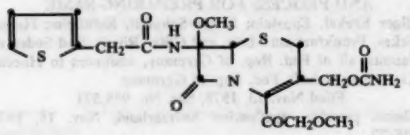
4,220,762

PROCESS FOR THE PREPARATION OF CEPHAMYCIN ANTIBIOTICS

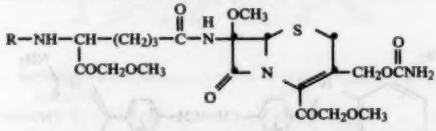
George M. Love, Mountainside, and Paul Sohar, Warren, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 30, 1979, Ser. No. 25,294
Int. Cl.[2] C07D *501/20*
U.S. Cl. 544—21 3 Claims

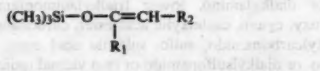
1. In the process of preparing the compound



by reacting thienylacetyl chloride with



wherein R is p-tosyl in an inert solvent such as methylene chloride at a temperature of between 50°-90° C., the improvement comprising carrying out the reaction in the presence of about 0.8 to 4 equivalents of trimethylsilyl enol ether



I

wherein R_1 can be lower alkyl of 1–4 carbon atoms; R_2 is hydrogen or loweralkyl of 1–4 carbon atoms; or R_1 and R_2 can be a joined alkyl chain of 2–4 carbon atoms;
for a time sufficient to reduce the intermediate imide level to less than 5%, then quenching by cooling to between 20° C. and −10° C., and recovering the product thereby produced.

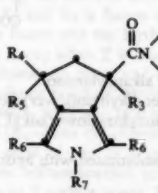
4,220,763

CYCLOPENTA[C]PYRRLE DERIVATIVES

Malcolm R. Bell, and Rudolf Oesterlin, both of East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 862,944, Dec. 21, 1977, which is a division of Ser. No. 772,003, Feb. 25, 1977, Pat. No. 4,126,620, which is a continuation-in-part of Ser. No. 703,949, Jul. 9, 1976, Pat. No. 4,098,797, which is a division of Ser. No. 558,807, Mar. 17, 1975, Pat. No. 4,008,250, which is a continuation-in-part of Ser. No. 346,005, Mar. 29, 1973, Pat. No. 3,928,380. This application Aug. 2, 1979, Ser. No. 63,108
Int. Cl.[2] C07D *413/06, 403/04*
U.S. Cl. 544—143 4 Claims

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl or di-lower-alkylamino-lower-alkyl; R_2 is hydrogen or lower-alkyl, or the group

can represent a 1-imidazolyl group; each of R_3, R_4 and R_5 is methyl; each R_6 group is the same or different hydrogen, formyl, carboxy, carbo-lower-alkoxy, carbo-lower-alkoxy-lower-alkyl, carbo-lower-alkoxy-lower-alkenyl, carboxy-lower-alkyl, carboxy-lower-alkenyl, methyl, lower-alkenyl or a group of the formula:

where R_8 is hydrogen or lower-alkyl; R_9 is hydrogen, cyano, lower-alkyl, lower-alkenyl, lower-alkynyl, phenyl, carbamyl, carbo-lower-alkoxy-lower-alkyl or carbo-lower-alkoxy-lower-alkynyl; R_{10} is hydrogen, benzoyl, lower-alkanoyl, carboxy-lower-alkanoyl and ammonium salts thereof, or lower-alkyl, R_{10} being other than hydrogen only when either one or both of R_8 and R_9 are hydrogen and R_9 being cyano only when R_{10} is hydrogen; and R_7 is morpholino-lower-alkyl or 2-pyrazinyl, and wherein the benzoyl group can be further substituted in the phenyl nucleus by a lower-alkyl group.

4,220,764

PREPARATION OF TERTIARY HETEROCYCLIC AMINES

Tamotsu Imai, Mt. Prospect, Ill., assignor to Uop Inc., Des Plaines, Ill.

Filed Dec. 20, 1978, Ser. No. 971,284
Int. Cl.[2] C07D *295/02*
U.S. Cl. 544—178 7 Claims

1. A process for the preparation of a tertiary amine which comprises reacting an olefinic compound, carbon monoxide, hydrogen and a heterocyclic compound containing at least one nitrogen atom which possesses at least one hydrogen atom in the presence of a rhodium chloride catalyst at reaction conditions, and recovering the resultant tertiary amine.

4,220,765

PROCESS FOR THE PREPARATION OF 4,6-DIHALOGENO-TRIAZINES

Kurt Findeisen, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusn, Fed. Rep. of Germany

Filed Nov. 30, 1978, Ser. No. 965,379
Claims priority, application Fed. Rep. of Germany, Dec. 17, 1977, 2756438
Int. Cl.[2] C07D *251/20, 257/08*
U.S. Cl. 544—179 7 Claims

1. A process for the preparation of a 4,6-dihalogeno-triazine of the formula

wherein
R represents phenyl or phenoxy radical or a 5 or 6-membered nitrogen-containing aromatic heterocyclic radical selected from the group consisting of pyrrolyl, pyrazoyl,

imidazolyl, triazolyl, pyridinyl, pyrimidinyl, pyrazinyl, triazinyl and tetrazinyl which radicals can be optionally mono or polysubstituted by a C_1–C_4-alkyl, C_1–C_4-alkoxy, halogeno, nitro, cyano, C_1–C_4-carbalkoxy, phenyl or phenoxy and

Hal^1 represents a halogen atom;

which comprises contacting a trihalogenomethyl compound of the formula

$$R—C(Hal^2)_3$$

wherein

R has the meaning indicated above and

Hal^2 represents a halogen atom,

with Hal^1—CN wherein Hal^1 has the meaning indicated above at a temperature from about 50° to about 200° C. in the presence of a Lewis acid.

4,220,766
OXAZOLINES

Teruji Tsuji, Takatsuki; Mitsuru Yoshioka; Shoichiro Uyeo, both of Toyonaka; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

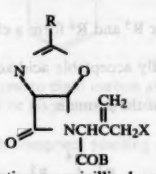
Filed Jan. 10, 1978, Ser. No. 868,422

Claims priority, application Japan, Jan. 10, 1977, 52-1760; Mar. 30, 1977, 52-36613

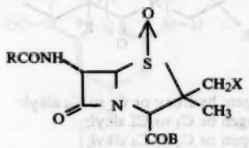
Int. Cl.² C07D *285/16, 491/04*

U.S. Cl. 544—182 **4 Claims**

1. A process for the preparation of a compound of the formula:



which comprises heating a penicillin 1-oxide of the following formula:



wherein

R represents (a) 1–6 C alkyl, (b) 7–15 C aralkyl, (c) 7–15 C heterocyclicalkyl, (d) 7–9 C aryloxyalkyl, (e) 7–9 C heterocyclicoxyalkyl, (f) 6–10 C aryl, (g) 6–10 C heterocyclic, (h) 1–6 C alkoxy, (i) 7–15 C aralkoxy, (j) 7–15 C heterocyclicalkoxy, (k) 6–10 C aryloxy, (l) 6–10 C heterocyclicoxy, (m) carbamoyl, or (n) 2–7 C carbalkoxy, each of said groups being unsubstituted or substituted by hydroxy, 1–6 C alkanoyloxy, 1–3 C alkoxy, 7–9 C aralkoxy, 6–8 C aryloxy, oxo, amino, 1–3 C alkylamino, 1–5 C alkanoylamino, nitro, 1–3 C alkyl, 6–10 C aryl, carboxy, protected carboxy, cyano or halo,

X represents (a) halo, (b) hydroxy, (c) up to 5 C acyloxy selected from the group of nitrooxy, sulfurous acyloxy, formyloxy, acetoxy, propionyloxy, trifluoroacetoxy, β-hydroxypropionyloxy, α-haloacetyloxy, benzyloxy, nicotinoyloxy, carbamoyloxy, methoxycarbonylox, aminopropionyloxy, sulfenyloxy and sulfinyloxy, (d) 1–6 C alkoxy, (e) thiocarbamoylthio, (f) 1–5 C alkylthio, (g) 6–9 C arylthio, (h) 6–9 C heterocyclicthio, or (i) 1–6 C sulfinyl, the aryl portion of the groups R and X and the substituents thereof being selected from the group of phenyl and naphthyl and the heterocyclic portion of the groups R and X being selected from the group consisting of furyl, thienyl, pyrrolyl, oxazolyl, isoxazolyl, oxadiazolyl, oxatriazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazolyl, triazolyl, tetrazolyl, pyridyl, pyrimidyl, pyrozinyl, as-triazinyl, quinolyl, isoquinolinyl, and 2-benzothiazolyl.

COB is carboxy or protected carboxy, and wherein the S→O and C—CH_3 bonds are in the cis positions with respect to each other.

4,220,767
TRIAZINONES

Thomas H. Brown, Welwyn Garden City, and Robert J. Ife, Stevenage, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

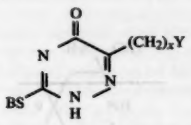
Division of Ser. No. 885,940, Mar. 13, 1978. This application Jun. 20, 1979, Ser. No. 50,387

Claims priority, application United Kingdom, Mar. 19, 1977, 11757/77; Mar. 21, 1977, 11828/77

Int. Cl.² C07D *253/06*

U.S. Cl. 544—182 **4 Claims**

1. A compound of the formula:



wherein B is lower alkyl or benzyl; x is 1 to 5 and Y is a 1- or 2-naphthyl ring, a 2,3-dihydro-1,4-benzodioxinyl or a 1,3-benzodioxolyl ring, a phenyl ring substituted with one or more lower alkyl, lower alkoxy, halogen, benzyloxy, hydroxy, loweralkoxyloweralkoxy, trifluoromethyl, di(lower alkyl)amino, phenoxy, halophenoxy, lower alkoxyphenoxy, phenyl, halophenyl or lower alkoxyphenyl groups, a 5 or 6 membered heterocycle selected from the group consisting of a pyridine, furan, thiophen, thiazole, oxazole, isothiazole, imidazole, pyrimidine, pyrazine or pyridazine ring, which ring is optionally substituted by lower alkyl, lower alkoxy, or Y is a pyridine, imidazole ring which has a benzene ring fused to it, or when x is other than 1, Y may also be phenyl.

4,220,768
PROCESS FOR THE PRODUCTION OF POLYCHLOROISOCYANURIC ACIDS

John A. Wojtowicz, Cheshire, and Michael Scardera, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed May 18, 1978, Ser. No. 906,908

Int. Cl.² C07D *251/28*

U.S. Cl. 544—190 **13 Claims**

1. In a process for the production of a polychloroisocyanuric acid by the reaction of chlorine gas with a cyanuric compound selected from the group consisting of cyanuric acid, alkali metal cyanurates and alkaline earth metal cyanurates, in a reaction mixture, and recovering said polychloroisocyanuric acid from said reaction mixture, the improvement which comprises adding to said reaction mixture a depressant selected from the group consisting of alkali metal salts of alkyl esters or sulfonated alkyl esters of dicarboxylic acids, where said dicarboxylic acids are succinic acid or glutaric acid, and ethylene oxide terminated alkoxylated alcohols having a cloud point of up to about 50° C.

4,220,769
CYANURIC ACID MANUFACTURE

Raymond J. Smialek, Lake Charles, La., and Neal E. Morganson, Pittsburgh, Pa., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 2, 1979, Ser. No. 54,083
Int. Cl.[2] C07D 251/32
U.S. Cl. 544—192 8 Claims

2. A process for the production of cyanuric acid by the pyrolysis of urea in a solvent in a closed reactor which comprises;

(a) pyrolyzing said urea in a hot solvent to produce a reaction mixture comprised of solid particles of cyanuric acid, said solvent and an off-gas,

(b) agitating said reaction mixture to form a slurry of cyanuric acid particles in said solvent and releasing said off-gas to a gas zone, during said release said off-gas entraining solid particles of cyanuric acid,

(c) removing said off-gas from said gas zone, said off-gas contacting the interior surfaces of said gas zone during removal, and

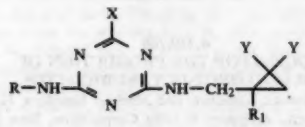
(d) applying said solvent in the presence of heat to said interior surfaces of said gas zone to inhibit the formation of solid deposits of said cyanuric acid on said interior surfaces.

4,220,770
TRIAZINE COMPOUNDS

Karl Gass, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

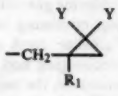
Filed Apr. 7, 1978, Ser. No. 894,448
Claims priority, application Switzerland, Apr. 14, 1977, 4629/77
Int. Cl.[2] C07D 251/50, 251/52, 251/54
U.S. Cl. 544—208 4 Claims

1. A compound of formula I



(I)

wherein R represents hydrogen, C_1–C_6 alkyl which is unsubstituted or substituted by cyano, hydroxy, C_1–C_4 alkoxy, cyclopropyl, methylcyclopropyl or the radical



wherein

R_1 represents hydrogen or methyl

X represents chlorine, methoxy, methylthio, azido or cyano and

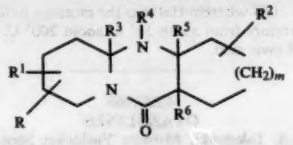
Y represents a halogen atom.

4,220,771
2,3-POLYMETHYLENE-4-OXO-4H-PYRIDO[1,2-A]PYRIMIDINES

István Hermecz, Budapest; Ferenc Fülop, Szeged; Zöltan Mészáros, Budapest; Gábor Bernáth, Szeged, and József Knoll, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Filed Aug. 18, 1978, Ser. No. 935,071
Claims priority, application Hungary, Aug. 19, 1977, CI 1766
Int. Cl.[2] C07D 487/14; A61K 31/505
U.S. Cl. 544—252 9 Claims

1. A compound of the formula:



wherein

R is a 6- or a 7-position halogen, C_1 to C_4 alkyl, nitro, amino, carboxy, methoxycarbonyl, ethoxycarbonyl or carbamoyl;

R^1 is a 6- or a 7-position hydrogen or C_1 to C_4 alkyl or is 8-methyl;

R^2 is hydrogen or C_1 to C_4 alkyl;

R^3 is hydrogen;

R^4 is hydrogen or C_1 to C_4 alkyl or R^3 and R^4 form a chemical bond;

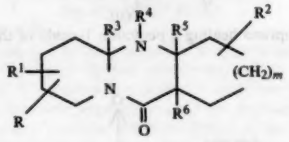
R^5 is hydrogen;

R^6 is hydrogen or R^5 and R^6 form a chemical bond; and

m is 1 or 2;

or a pharmaceutically acceptable acid addition or quaternary salt thereof.

3. A compound of the formula:



wherein

R is hydrogen, hydroxy or C_1 to C_4 alkyl;

R^1 is hydrogen or C_1 to C_4 alkyl;

R^2 is hydrogen or C_1 to C_4 alkyl;

R^3 is hydrogen;

R^4 is hydrogen or C_1 to C_4 alkyl or R^3 and R^4 form a chemical bond;

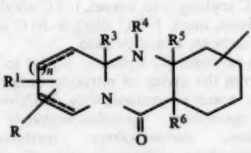
R^5 is hydrogen;

R^6 is hydrogen or R^5 and R^6 form a chemical bond; and

m is 3 or 4;

or a pharmaceutically acceptable acid addition or quaternary salt thereof.

4. A compound of the formula:



wherein

R is hydrogen or C_1 to C_4 alkyl;

R^1 is hydrogen or C_1 to C_4 alkyl;

R^2 is hydrogen or C_1 to C_4 alkyl;
R^3 is hydrogen;
R^4 is hydrogen or C_1 to C_4 alkyl or R^3 and R^4 form a chemical bond;
R^5 is hydrogen;
R^6 is hydrogen or R^5 and R^6 form a chemical bond; and
n is 2; or a pharmaceutically acceptable acid addition or quaternary salt thereof.

4,220,772
PROCESS FOR THE PREPARATION OF OXADIAZOLOPYRIMIDINE DERIVATIVES

Jean-Claude Muller, Rixheim, France, and Henri Ramuz, Birsfelden, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

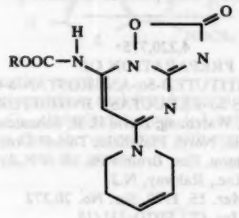
Filed Jul. 6, 1979, Ser. No. 55,230

Claims priority, application Switzerland, Jul. 21, 1978, 7910/78

Int. Cl.[2] A61K *31/505;* **C07D** *498/04*

U.S. Cl. 544—255 **4 Claims**

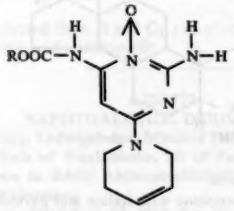
1. A process for the preparation of a compound of the formula



I

wherein R is alkyl of one to eight carbon atoms or alkoxyalkyl wherein the alkoxy or alkyl moiety has one to eight carbon atoms,

or salt thereof, which comprises reacting a compound of the formula



II

wherein R is as set forth above,

with phosgene and, if desired, converting a resulting compound of formula I into a salt.

4,220,773
PROCESS FOR THE MANUFACTURE OF AZA-SPIRODECANES

Hartmut Wiezer, Gersthofen; Helmut Korbanka, Adelsried, and Norbert Mayer, Gablingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

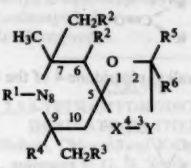
Filed Aug. 6, 1979, Ser. No. 64,056

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2834962

Int. Cl.[2] C07D *405/04*

U.S. Cl. 546—19 **3 Claims**

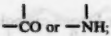
1. A process for the manufacture of aza-spirodecanes of the formula (I)



(I),

in which

X and Y, being different, each are

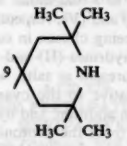


R^1 is hydrogen or C_1–C_{12}-alkyl

R^2 and R^3, either are identical and represent each hydrogen or a C_1–C_5-alkyl group

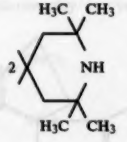
R^4 being a methyl group in this case, or R^2 is hydrogen or C_1–C_5-alkyl, and

R^3 and R^4, together with the carbon atoms to which they are linked, form a C_5- or C_6-cycloalkyl group, or a group of the formula

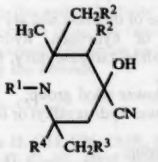


R^5 and R^6 being identical or different, each are hydrogen, C_1–C_{30}alkyl, a phenyl or naphthyl group being unsubstituted or substituted by chlorine or C_1–C_4-alkyl, or a phenylalkyl group being unsubstituted or substituted by C_1–C_4-alkyl; or

R^5 and R^6, together with the carbon atom linked to them are a C_5–C_{18}-cycloalkyl group being unsubstituted or substituted by up to four C_1–C_4-alkyl groups, or a group of the formula



which comprises reacting a polyalkyl-piperidone-4-cyanohydrine of the formula (II)

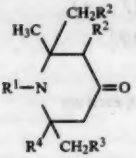


(II),

with an aldehyde or ketone of the formula (III)

(III)

or reacting a polyalkyl-piperidone-4 of the formula (IV)



(IV)

with an aldehyde- or ketone-cyanohydrine of the formula (V)

(V)

at a temperature of from 20° to 120° C. in the presence of an aliphatic carboxylic acid liquid at room temperature as solvent, and in the presence of an inorganic protonic acid; the carbonyl compounds (III) and (IV), respectively, being used in a 1- to 3-fold molar amount relative to the cyanohydrines (II) and (V), respectively, and the amount of protonic acid being chosen in such a manner that the piperidone-cyanohydrines (II) and the piperidones (IV), respectively, are present as salts, while the 0.5 to 2-fold molar amount relative to the cyanohydrine to be converted is present in addition, and by subsequently liberating the free base from the protonic acid salt of the intended azaspirodecane so obtained by treatment with a stronger base.

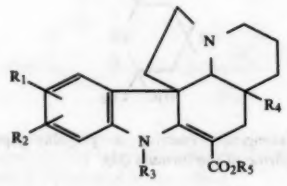
4,220,774

VINCADIFFORMINE SYNTHESIS PROCESS

Martin E. Kuehne, Burlington, Vt., assignor to Omnium Chimique, Brussells, Belgium

Filed Oct. 26, 1978, Ser. No. 954,741
Int. Cl.² C07D *471/08*
U.S. Cl. 546—51 **10 Claims**

1. A process for the preparation of vincadifformine and substituted vincadifformines of the formula:



wherein:

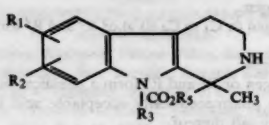
R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, hydroxy, lower alkanoyloxy, lower alkyl carbamoyloxy, halo, lower alkyl and alkoxy groups;

R_3 is hydrogen or a lower alkyl group;

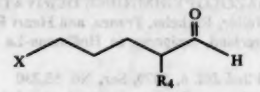
R_4 is a lower alkyl, lower hydroxyalkyl or lower alkoxyalkyl group;

R_5 is a lower alkyl group;

the process comprising the step of condensing a carboline derivative of the formula



wherein R_1, R_2, R_3, and R_5 have the aforementioned meanings, with an aldehyde of the formula



wherein X is a good leaving group selected from the group consisting of halo, benzene sulfoxy, P-toluenesulfoxy, lower alkyl or fluoralkylsulfoxy groups and R_4 has the same meaning as described above, this condensation being effected in a solvent inert to the reaction conditions and at a temperature in the range of 30° C. to the boiling point of the solvent.

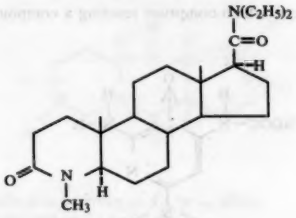
4,220,775

PREPARATION OF 4-AZA-17-SUBSTITUTED-5α-ANDROSTAN-3-ONES USEFUL AS 5α-REDUCTASE INHIBITORS

Gary H. Rasmusson, Watchung; David B. R. Johnston, Warren; Donald F. Reinhold, North Plainfield; Torleif Utne, Warren, and Ronald B. Jobson, East Brunswick, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1979, Ser. No. 20,372
Int. Cl.² C07D *221/18*
U.S. Cl. 546—77 **2 Claims**

1. A method of preparing the compound of the formula:



comprising the steps of

(1) treating pregnenolone with iodine and pyridine to form the corresponding 20-pyridinium iodide derivative of pregnenolone;

(2) methanolyzing the product of step (1) to form the methyl ester of 17-carboxy androstenol:

(3) treating the product of step (2) with aluminum isopropoxide and cyclohexanone to form methyl-4-androsten-3-one-17-carboxylate;

(4) hydrolyzing the product of step (3) to form the corresponding 17-acid compound;

(5) treating the product of step (4) with an oxalyl chloride: pyridine complex to form the corresponding 17-acid chloride compound;

(6) treating the product of step (5) in situ with diethylamine to form 17β-N,N-diethylcarbamoyl-4-androsten-3-one;

(7) oxidizing the product of step (6) with sodium periodate and potassium permanganate in a tert-butanol: water solvent system to form the corresponding 5-oxo-3,5-secoandrostan-3-oic acid compound;

(8) treating the product of step (7) with methylamine in

ethylene glycol to form 17β-N,N-diethylcarbamoyl-4-methyl-4-aza-5-androsten-3-one;

(9) hydrogenating the product of step (8) by treating it with hydrogen under catalytic conditions to form the final product, 17β-N,N-diethylcarbamoyl-4-methyl-4-aza-5α-androstan-3-one.

4,220,776
N-(PYRIDOTHIENOPYRAZOL)AMIDES

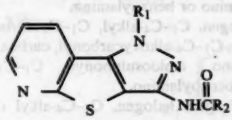
Joel G. Whitney, Kennett Square, Pa., and Edward C. Hermann, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 885,252, Mar. 10, 1978, abandoned. This application Dec. 21, 1978, Ser. No. 970,732

Int. Cl.² C07D *495/14*

U.S. Cl. 546—83 **10 Claims**

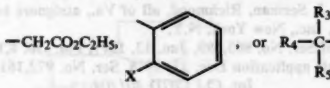
1. A compound of the formula



, wherein

R_1 is methyl or ethyl;

R_2 is selected from cyclohexyl, benzyl, 3-pyridyl, 1-adamantyl, C_{2-5} haloalkyl having 1–3 halogen substituents in other than the α-position with respect to the carbonyl group, and the groups



wherein

X is H, Cl, or F;

R_3 and R_4 are independently selected from H and C_{1-3} alkyl; and

R_5 is selected from H and C_{1-5} alkyl; or a pharmaceutically suitable acid addition salt.

4,220,777
NAPHTHALIMIDE DERIVATIVES

Jochen Karg, Ludwigshafen; Manfred Patsch, and Walter Himmele, both of Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

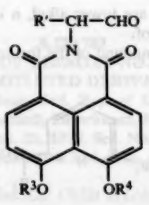
Filed Nov. 17, 1978, Ser. No. 961,485

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753152

Int. Cl.² C07D *221/14*

U.S. Cl. 546—98 **3 Claims**

1. A naphthalimide having the formula:



wherein

R′ is hydrogen or C_1- to C_4-alkyl; and,

R^3 and R^4 independently of one another are C_1- to C_4-alkyl, β-hydroxyethyl, β-hydroxypropyl, β-C_1- to C_4-alkoxyethyl or β-C_1- to C_4-alkoxypropyl.

4,220,778
8-ARYL-1,2,3,4-TETRAHYDROISOQUINOLINE AND DERIVATIVES THEREOF

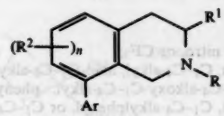
Charles R. Ellefson, Chicago, and Kathleen Prodan, Wheeling, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Filed Oct. 30, 1978, Ser. No. 956,467

Int. Cl.² C07D *217/04, 217/18*

U.S. Cl. 546—150 **18 Claims**

1. A compound of the formula



and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein R is hydrogen, benzyl, or an alkyl group of 1 to 7 carbon atoms, R^1 is hydrogen or an alkyl group of 1 to 7 carbon atoms; R^2 in each occurrence is, alike or different, hydrogen, and alkyl group of 1 to 7 carbon atoms or alkoxy group of 1 to 7 carbon atoms; Ar is phenyl unsubstituted or substituted with up to 5 halogens alkyl groups of 1 to 7 carbon atoms, or alkoxy groups of 1 to 7 carbon atoms; and n is positive integer 1,2 or 3.

4,220,779
PROCESS FOR THE PREPARATION OF QUINOLINE DERIVATIVES

Volker Ehrig, Bergisch-Gladbach, Fed. Rep. of Germany; Hans-Samuel Bien, deceased, late of Burscheid, Fed. Rep. of Germany (by Else Bien, Gabriele Bien, Dorothee Bien, legal representatives); Erich Klauke, Odenthal, and Detlef-Ingo Schutze, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

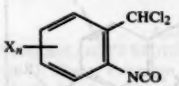
Filed Jun. 30, 1978, Ser. No. 920,778

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1977, 2730061

Int. Cl.² C07D *215/12, 215/14, 215/18, 215/54*

U.S. Cl. 546—152 **3 Claims**

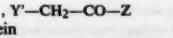
1. A process for the prepartion of quinoline wherein an aromatic ortho-dichloromethyl isocyanate of the formula



wherein

X represents halogen, nitro or CF_3 and

n represents an integer from 0 to 4 with the value being 1 when X is nitro or CF_3 and being 1–4 when X is halogen; is treated with barium hydroxide to produce the corresponding ortho-aminoaldehyde, which is then reacted, without isolation from the reaction medium, with a carbonyl compound containing an active α-methylene group and having the formula



wherein

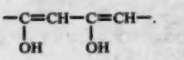
Y′ represents H, OH, CN, COR, halogen, or SO_3H;

Z represents H, C_1–C_4, alkyl, phenyl, halophenyl, nitrophenyl, C_1–C_4-alkylphenyl or C_1–C_4-alkoxyphenyl and

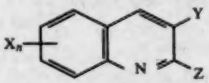
R represents C_1–C_4 alkyl, C_1–C_4 alkoxy, or phenyl; C_1–C_4 haloalkyl, C_1–C_4 cyanoalkyl, C_1–C_4-alkoxyalkyl, halo-

phenyl, nitrophenyl, C_1–C_4-alkylphenyl or C_1–C_4-alkoxyphenyl; and

Z and Y', when joined together, are C_2–C_4 are alkylene or



2. Quinolines of the formula



wherein

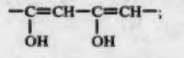
X is halogen, nitro, or CF_3;

Z is hydrogen, C_1–C_4-alkyl, halo-C_1–C_4-alkyl, cyano-C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, phenyl, halophenyl, nitrophenyl, C_1–C_4-alkylphenyl, or C_1–C_4-alkoxyphenyl;

Y is CN or COR;

R is C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl, halo-C_1–C_4-alkyl, cyano-C_1–C_4-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkyl, halophenyl, nitrophenyl, C_1–C_4-alkylphenyl, or C_1–C_4-alkoxyphenyl;

Z and Y, when joined together, are C_3–C_4-alkylene or



and

n is an integer from 0 to 4, with the value being 1 when X is nitro or CF_3 and being 1–4 when X is halogen.

4,220,780

CATIONIC DYESTUFFS

Alfred Brack, Odenthal, Fed. Rep. of Germany, assignor to Bayer Atkiengesellschaft, Leverkusen, Fed. Rep. of Germany

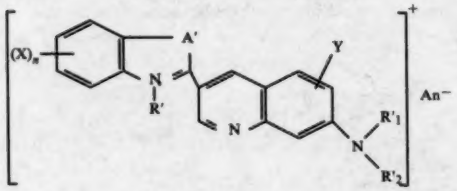
Filed May 9, 1978, Ser. No. 904,444

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721190

Int. Cl.[2] C07D *417/04*; D06P *1/38*

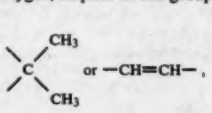
U.S. Cl. 546—167 **6 Claims**

1. Cationic dyestuff of the formula



wherein

A' represents oxygen, sulphur or the groupings $>N—R'_3$,



wherein

R'_3 denotes a C_1–C_4-alkyl radical, which can be substituted by halogen, hydroxyl, C_1–C_4-alkoxy, phenyloxy, benzyloxy, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl or cyano, or a phenyl, benzyl or β-phenyl-C_1–C_4-alkyl radical, which can be substituted in the phenyl radical by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl, cyano, amidosulphonyl, C_1–C_3-alkylcarbonylamino or benzoylamino,

R' represents hydrogen or a C_1–C_6-alkyl radical, which can be substituted by halogen, hydroxyl, C_1–C_4-alkoxy, phenyloxy, benzyloxy, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl or cyano,

R'_1 and R'_2 independently of one another represent hydrogen or a C_1–C_6-alkyl radical, which can be substituted by one or two substituents from the group consisting of halogen, hydroxyl, C_1–C_6-alkoxy, phenyloxy, benzyloxy, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl or cyano, or a phenyl, benzyl or β-phenyl-C_1–C_4-alkyl radical, which can be substituted in the phenyl radical by one to three substituents from the group consisting of halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl, cyano, amidosulphonyl, C_1–C_3-alkylcarbonylamino or benzoylamino,

X represents halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyloxy, benzyloxy, C_1–C_4-alkoxycarbonyl, carboxyl, amidocarbonyl, cyano, amidosulphonyl, C_1–C_3-alkylcarbonylamino or benzoylamino,

Y represents hydrogen, halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

n represents 0, 1 or 2 and

An^- represents an anion.

4,220,781

PROCESS FOR PREPARING 2-ALKYL NICOTINOIDS

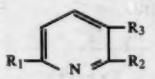
Edward B. Sanders, Richmond; Henry V. Secor, Midlothian, and Jeffrey I. Seeman, Richmond, all of Va., assignors to Philip Morris, Inc., New York, N.Y.

Division of Ser. No. 805,689, Jun. 13, 1977, Pat. No. 4,155,909. This application Dec. 21, 1978, Ser. No. 972,161

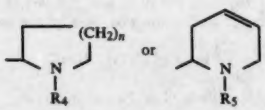
Int. Cl.[2] C07D *401/04*

U.S. Cl. 546—193 **5 Claims**

1. A process for preparing a compound represented by the formula (II):

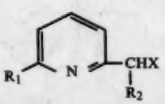


wherein R_1 is hydrogen, lower alkyl, phenylalkyl or aralkyl, R_2 is lower alkyl or phenylalkyl, and R_3 is a heterocyclic represented by the formula:



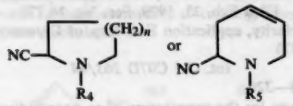
wherein R_4 and R_5 are lower alkyl, n is one or two, which comprises the steps of:

a. providing a compound of the formula:

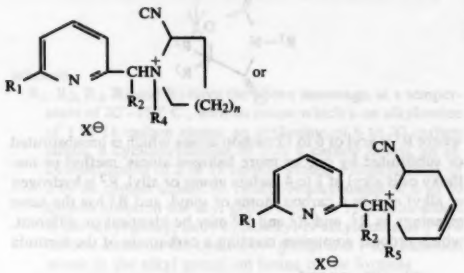


wherein R_1 is as defined above, R_2 is hydrogen, lower alkyl, phenyl or phenylalkyl, X is halogen selected from chloride, bromide, iodide or fluoride, and reacting the

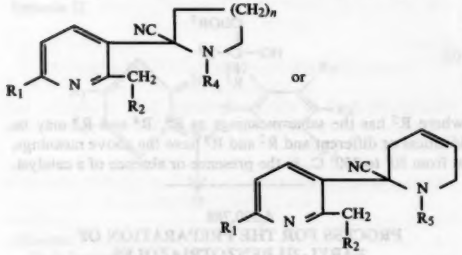
same with a 2-cyano-N-substituted-heterocyclic of the formula:



wherein R_4, R_5 and n are as defined above, to yield a reaction compound of the formula:



b. treating the product of step (a) with a strong nonnucleophilic base to yield a [2,3]-rearrangement product of the formula:



wherein R_1, R_2, R_4, R_5 and n are the same as defined in step (a),

c. treating the product of step (b) with a complex hydride reducing agent to reductively decyanate the compound, and then,

d. isolating the product of said reduction reaction to yield a compound of Formula II.

4,220,782

PREPARATION OF 1-DESOXY-NOJIRIMICIN AND N-SUBSTITUTED DERIVATIVES

Jürgen Stoltefuss, Haan, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

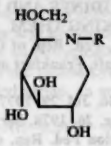
Filed Jun. 21, 1979, Ser. No. 50,907

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830469

Int. Cl.² C07D *211/46*

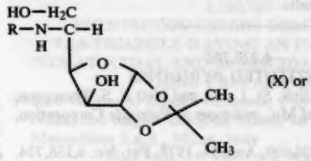
U.S. Cl. 546—242 **9 Claims**

1. A process for the production of 1-desoxy-nojirimicin or an N-substituted derivative thereof, of the formula



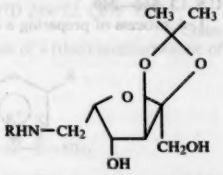
(I)

in which R denotes a hydrogen atom or an alkyl, aralkyl or aryl group, which comprises deblocking a compound of the general formula



(X) or

(XI)



in which R has the meaning indicated above, by treatment with a strong mineral acid and isolating the intermediate product in the form of a salt thereof and then hydrogenating said salt with a suitable hydrogen donor, or, in a one-pot process, first deblocking the starting material by treatment with a strong mineral acid at a normality adequate to preclude the formation of a pyridine compound and, after controlled addition of a base, hydrogenating directly.

4,220,783

SYNTHESIS OF PYRIDINE AND ALKYLPYRIDINES

Clarence D. Chang, Princeton, and William H. Lang, Pennington, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 9, 1979, Ser. No. 37,265

Int. Cl.² C07D *213/08, 213/10*

U.S. Cl. 546—251 **16 Claims**

1. A method for synthesizing alpha picoline which comprises effecting reaction between ammonia and a carbonyl reactant selected from the group consisting of aldehydes containing from 2 to 4 carbon atoms, ketones containing from 3 to 5 carbon atoms and mixtures of said aldehydes and ketones under suitable reaction conditions of temperature, pressure and space velocity in the presence of a catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, which zeolite has been ion exchanged with cadmium and recovering from the resulting reaction mixture, a product containing alpha picoline.

4,220,784

SUBSTITUTED PYRIDINES AND PROCESS FOR MAKING THEM

Horst Tappe, Dietzenbach, Fed. Rep. of Germany, assignor to Cassella Aktiengesellschaft, Frankfurt am Main Fechenheim, Fed. Rep. of Germany

Division of Ser. No. 819,756, Jul. 29, 1977, Pat. No. 4,157,446. This application Dec. 26, 1978, Ser. No. 973,230

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1976, 2635205; Aug. 5, 1976, 2635206

Int. Cl.[2] C07D *213/48*

U.S. Cl. 546—296 **2 Claims**

1. A compound selected from the class consisting of 3-formyl-4-methyl-2,6-dihydroxy pyridine, and its alkali metal and alkaline earth metal salts.

4,220,785

SUBSTITUTED PYRIDINES

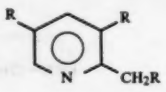
Bernardus A. Oude Alink, St. Louis, and Neil E. S. Thompson, Creve Coeur, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 604,609, Aug. 14, 1975, Pat. No. 4,158,734. This application Aug. 25, 1978, Ser. No. 937,627

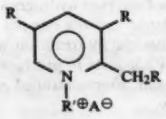
Int. Cl.[2] C07D *213/06*

U.S. Cl. 546—349 **6 Claims**

1. A process of preparing a compound of the formula



which comprises thermally dealkylating a compound of the formula



where R is an alkyl, aryl, cycloalkyl, alkaryl, aralkyl or heterocyclic group or a substituted derivative thereof, R′ is a hydrocarbon group, a substituted hydrocarbon group or a heterocyclic group, and $A^{\ominus}$ is a carboxylate anion.

4,220,786

COMPOSITION OF MATTER AND PROCESS

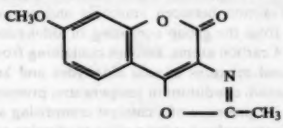
Herman Hoeksema, Kalamazoo, Mich.

Division of Ser. No. 874,767, Feb. 6, 1978, Pat. No. 4,137,410, which is a continuation-in-part of Ser. No. 793,785, May 5, 1977, abandoned. This application Aug. 31, 1978, Ser. No. 938,685

Int. Cl.[2] C07D *497/04*

U.S. Cl. 548—218 **3 Claims**

3. A process for preparing the compound of the following structural formula:



VIII

which comprises reacting a compound selected from the group consisting of rubradirin, rubradirin B, compound IV, compound V, compound VII and compound XI with pyridine and acetic anhydride at reflux.

4,220,787

PREPARATION OF OXAZOLIDINE-2,4-DIONES

Herbert Scholz, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

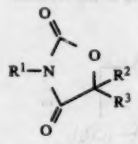
Filed Feb. 23, 1979, Ser. No. 14,770

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813873

Int. Cl.[2] C07D *263/44*

U.S. Cl. 548—226 **2 Claims**

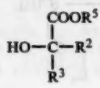
1. A process for the preparation of an oxazolidine-2,4-dione of the formula



where R^1 is aryl of 6 to 12 carbon atoms which is unsubstituted or substituted by one or more halogen atoms, methyl or methoxy or is alkyl of 1 to 4 carbon atoms or allyl, R^2 is hydrogen or alkyl of 1 to 4 carbon atoms or vinyl, and R^3 has the same meanings as R^2, and R^2 and R^3 may be identical or different, which process comprises reacting a carbamate of the formula

$$R^1—NH—COOR^4$$

where R^1 has the above meanings and R^4 is alkyl of 1 to 10 carbon atoms or cyclohexyl or aryl of 6 carbon atoms with a 2-hydroxycarboxylic acid ester of the formula



where R^5 has the same meanings as R^4, R^4 and R^5 may be identical or different and R^2 and R^3 have the above meanings, at from 80° to 250° C., in the presence or absence of a catalyst.

4,220,788

PROCESS FOR THE PREPARATION OF 2-ARYL-2H-BENZOTRIAZOLES

Rolf Bader, Riehen; Leopold Küng, Pratteln, and Peter Waldvogel, Füllinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

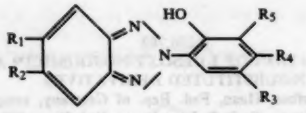
Filed Aug. 10, 1978, Ser. No. 932,730

Claims priority, application Switzerland, Aug. 17, 1977, 10091/77

Int. Cl.[2] C07D *249/20*

U.S. Cl. 548—259 **29 Claims**

1. A process for producing a benzotriazole of the formula I



(I)

wherein

R_1 is hydrogen or chlorine,

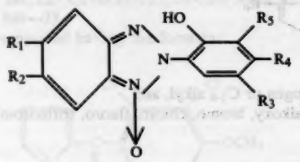
R_2 is hydrogen, chlorine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_9 alkoxycarbonyl, carboxyl or sulfo,

R_3 is C_1–C_{12} alkyl, C_1–C_4 alkoxy, phenyl, (C_1–C_8 alkyl)-phenyl, C_5–C_6 cycloalkyl, C_2–C_9 alkoxycarbonyl, chlorine, carboxyethyl or C_7–C_9 phenylalkyl,

R_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine or hydroxyl, and

R_5 is hydrogen, C_1–C_{12} alkyl, chlorine, C_5–C_6 cycloalkyl or C_7–C_9 phenylalkyl,

which process consists essentially of treating a benzotriazole-N-oxide of the formula II



(II)

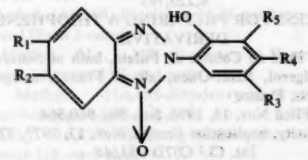
wherein

R_1, R_2, R_3, R_4 and R_5 have the above meanings, at a temperature of 20°–150° C., with an amine which is an alkylamine of 1 to 18 carbon atoms, an arylamine of 6 to 20 carbon atoms, a cycloalkylamine of 5 to 8 carbon atoms, an alkylenediamine of 2 to 18 carbon atoms, a dialkylamine of 2 to 36 carbon atoms, an N-aryl-N-alkylamine of 6 to 10 carbon atoms in the aryl group and 1 to 18 carbon atoms in the alkyl group, an N-cycloalkyl-N-alkylamine of 5 to 8 carbon atoms in the cycloalkyl group and 1 to 18 carbon atoms in the alkyl group, an amine of the formula

$$NH_2—(CH_2)_n—NH—(CH_2)_m—NH_2$$

where n and m independently are 2 to 6; pyrrolidine, piperidine, piperazine or morpholine; or mixtures thereof.

11. A process for producing a benzotriazole-N-oxide of the formula II



(II)

wherein

R_1 is hydrogen or chlorine,

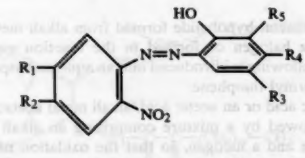
R_2 is hydrogen, chlorine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_9 alkoxycarbonyl, carboxyl or sulfo,

R_3 is C_1–C_{12} alkyl, C_1–C_4 alkoxy, phenyl, (C_1–C_8-alkyl)-phenyl, C_5–C_6 cycloalkyl, C_2–C_9 alkoxycarbonyl, chlorine, carboxyethyl or C_7–C_9 phenylalkyl,

R_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, chlorine or hydroxyl, and

R_5 is hydrogen, C_1–C_{12} alkyl, chlorine, C_5–C_6 cycloalkyl or C_7–C_9 phenylalkyl,

which process consists essentially of treating an o-nitroazobenzene of the formula III



(III),

wherein

R_1, R_2, R_3, R_4 and R_5 have the above meanings, at a temperature of 20°–150° C. with an amine which is an alkylamine of 1 to 18 carbon atoms, an arylamine of 6 to 20 carbon atoms, a cycloalkylamine of 5 to 8 carbon atoms, an alkylene diamine of 2 to 18 carbon atoms, a dialkylamine of 2 to 36 carbon atoms, an N-aryl-N-alkylamine of 6 to 10 carbon atoms in the aryl group and 1 to 18 carbon atoms in the alkyl group, an N-cycloalkyl-N-alkylamine of 5 to 8 carbon atoms in the cycloalkyl group and 1 to 18 carbon atoms in the alkyl group, an amine of the formula

$$NH_2—(CH_2)_n—NH—(CH_2)_m—NH_2$$

where n and m independently are 2 to 6; pyrrolidine, piperidine, piperazine or morpholine; or mixtures thereof; and isolating the N-oxide before further reaction thereof.

4,220,789

PHOSPHORIC ESTERS DERIVED FROM 1,2,4-TRIAZOLE HAVING AN INSECTICIDAL, NEMATOCIDAL AND ACARICIDAL ACTION, AND THEIR PREPARATION

Franco Gozzo, S. Donato Milanese; Pier Marino Boschi, Piacenza, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

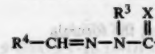
Filed Nov. 14, 1977, Ser. No. 851,202

Claims priority, application Italy, Nov. 17, 1976, 29420 A/76; Mar. 3, 1977, 20855 A/77

Int. Cl.[2] A01N 9/36; C07D 249/12; C07F 9/65

U.S. Cl. 548—263 **1 Claim**

1. A process for the cyclization of a (thio)-semicarbazone of formula:

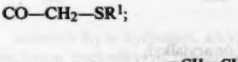


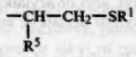
wherein:

X=O, S;

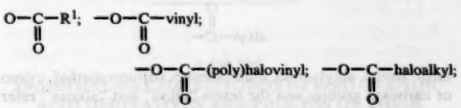
R^3=H; alkyl with from 1 to 5 carbon atoms; phenyl; benzyl; alkenyl with from 2 to 6 carbon atoms; alkynyl with from 2 to 6 carbon atoms;

R^4=vinyl; halovinyl; polyhalovinyl; vinyl substituted with phenyl groups, alkyl groups with from 1 to 4 carbon atoms, O-alkyl groups with from 1 to 4 carbon atoms, S-alkyl groups with from 1 to 4 carbon atoms; haloalkyl; acetyl; cyclohexenyl; benzoyl;



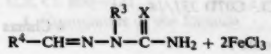


where R^5=OH;



Cl; SR^1; OR^1; $N(R^1)_2$; NHR^1;

R^1=alkyl with from 1 to 5 carbon atoms; to a 1—R^3—3—R^4—1,2,4-triazol-5-one (or thione) characterized in that the cyclization is achieved with ferric chloride in acetic acid at boiling temperature, according to the reaction:



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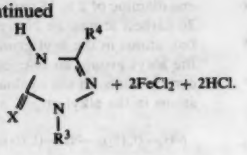


4,220,790

1-N,N-DIMETHYLCARBAMYL-3-TERT.BUTYL-5-METHYLTHIO-1,2,4-TRIAZOLE

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 662,171, Mar. 1, 1976, Pat. No. 4,066,774. This application Oct. 17, 1977, Ser. No. 842,760

Int. Cl.[2] A01N *47/38*; C07D *249/12*

U.S. Cl. 548—265 **1 Claim**

1. 1-N,N-Dimethylcarbamyl-3-tert.butyl-5-methylthio-1,2,4-triazole.

4,220,791

MERCAPTOACYLPYRAZOLIDINONE CARBOXYLIC ACID DERIVATIVES

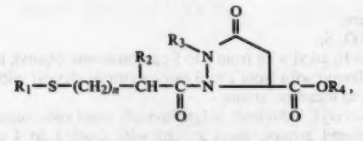
George C. Rovnyak, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 8, 1979, Ser. No. 18,547

Int. Cl.[2] C07D *231/08*

U.S. Cl. 548—367 **22 Claims**

1. A compound having the formula



or a physiologically acceptable basic salt thereof, wherein R_1 is hydrogen, alkyl, aryl, arylalkyl or

wherein R_5 is alkyl or aryl;
R_2 is hydrogen or alkyl;
R_3 is hydrogen, alkyl, aryl or arylalkyl;
R_4 is hydrogen, alkyl, or arylalkyl; and
n is 0, 1 or 2;
wherein the term "aryl" refers to phenyl or phenyl substituted with one, two or three halogen, alkyl, alkoxy, hydroxy,

nitro, amino, alkylamino, dialkylamino, trifluoromethyl, cyano or carboxyl groups; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

4,220,792

1-PHENYL-PYRAZOLE DERIVATIVES

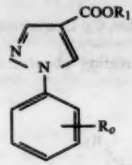
Paul L. Anderson, Dover, and Nicholas A. Paolella, Livingston, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Filed Jan. 25, 1979, Ser. No. 6,462

Int. Cl.[2] C07D *231/14*

U.S. Cl. 548—378 **4 Claims**

1. A compound of formula I':



(I')

wherein
R_1 is hydrogen or C_{1-6} alkyl, and
R_0 is C_{1-4} alkoxy, bromo, chloro, fluoro, trifluoromethyl or

where R_2 is hydrogen or C_{1-4} alkyl,
or a pharmaceutically acceptable simple or acid addition salt thereof.

4,220,793

PROCESS FOR PREPARING A THIOPHENE DERIVATIVE

Yves Bazile; Paul de Cointet de Fillain, both of Sisteron, and Charles Pigerol, Saint-Ouen, all of France, assignors to Labaz, Paris, France

Filed Nov. 14, 1978, Ser. No. 960,564

Claims priority, application France, Nov. 17, 1977, 77 34554

Int. Cl.[2] C07D *333/44*

U.S. Cl. 549—68 **4 Claims**

1. Process for preparing 5-nitro-2-thenoic acid of the formula:

by reacting 5-nitro-2-formyl-thiophene of the formula:

with an alkali metal hypohalide formed from alkali metal hydroxide and a halogen or formed in the reaction medium, wherein the following is introduced into an aqueous suspension of 5-nitro-2-formyl-thiophene:

either acetic acid or an acetic acid/alkali metal acetate mixture, followed by a mixture comprising an alkali metal hydroxide and a halogen, so that the oxidation reaction takes place at a pH between 4.5 and 6.5

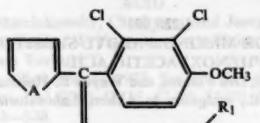
or an alkali metal carbonate, an alkali metal bicarbonate or an alkali metal acetate/acetic acid mixture and then a halogen, so that the oxidation reaction takes place at a pH between 4.5 and 11.

4,220,794
SYNTHETIC INTERMEDIATES FOR THE PREPARATION OF DIAROMATIC O-(AMINO-ALKYL)OXIMES

Jacqueline Laforest, Vincennes, France, assignor to Albert Roland S.A., Paris, France

Filed May 15, 1979, Ser. No. 39,433
Claims priority, application France, Jun. 8, 1978, 78 17159
Int. Cl.² C07D *333/22, 307/20;* A61K *31/34*
U.S. Cl. 549—77 1 Claim

1. A compound having the formula:



(II)

in which n is an integer from 1 to 4, A is selected from the group consisting of oxygen and sulfur and R_1 and R_2 are independently selected from the group consisting of hydrogen and C_{1-4} alkyl.

4,220,795
CYCLOBUTYL SUBSTITUTED DERIVATIVES OF PROSTAGLANDIN ANALOGS

Harold C. Kluender, and Henry C. Arndt, both of Madison, Wis., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 808,279, Jun. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 693,643, Jun. 6, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,663
Int. Cl.² C07L *179/00*
U.S. Cl. 560—118 6 Claims

1. Methyl 11α,15R-dihydroxy-16,18-methano-16-methyl-9-oxoprost-13E-en-1-oate.

2. Methyl 11α, 15R-dihydroxy-16,18-methano-20,20-propano-9-oxoprost-13E-en-1-oate.

3. Methyl 11α,15S-dihydroxy-16,18-methano-20,20-propano-9-oxoprost-13E-en-1-oate.

4. Methyl 11α,15R-dihydroxy-16,18-methano-19,20-ethano-9-oxoprost-13E-en-1-oate.

5. Methyl 11α,15S-dihydroxy-16,18-methano-19,20-ethano-9-oxoprost-13E-en-1-oate.

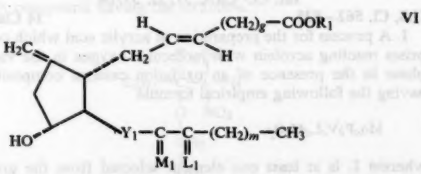
6. A compound having the formula:

4,220,796
9-DEOXY-9-METHYLENE-5,6-DIDEHYDRO-PGF$_1$ COMPOUNDS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 1, 1979, Ser. No. 35,144
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 20 Claims

1. A prostaglandin analog of formula VI



VI

wherein Y_1 is trans-CH=CH—, —C≡C—, —CH_2CH_2—, or cis-CH=CH-;
wherein M_1 is α-R_5:β-OH or α-OH:β-R_5, wherein R_5 is hydrogen or methyl;
wherein L_1 is α-R_3:β-R_4, α-R_4:β-R_3, or a mixture of α-R_3:β-R_4 and α-R_4:β-R_3, wherein R_3 and R_4 are hydrogen, methyl or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein g is 3, 4, or 5;
wherein m is an integer from one to 5, inclusive;
wherein R_1 is
(a) hydrogen;
(b) alkyl of one to 12 carbon atoms, inclusive;
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive;
(d) aralkyl of 7 to 12 carbon atoms, inclusive;
(e) phenyl;
(f) phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms;
(g) phenyl substituted in the para position by
(i) —NH—CO—R_{25}
(ii) —CO—R_{26}
(iii) —O—CO—R_{27}
(iv) —CH=N—NH—CO—NH_2

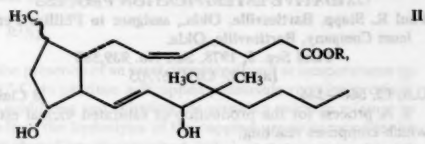
whereR_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or —NH_2; R_{26} is hydroxy, methyl, phenyl, —NH_2 or methoxy; and R_{27} is phenyl or acetamidophenyl; inclusive, or a pharmacologically acceptable salt thereof when R_1 is hydrogen.

4,220,797
NOVEL 9-DEOXY-16,16-DIMETHYL-PGF$_2$ COMPOUNDS, INTERMEDIATES AND PROCESS

Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 18, 1979, Ser. No. 40,003
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 9 Claims

1. A prostaglandin analog of formula II



II

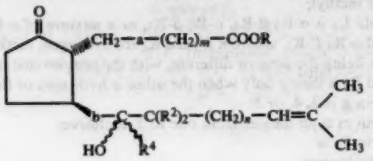
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 2 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,220,798
19-METHYL-9-KETO-15-HYDROXY-PROST-18-ENOIC ACID DERIVATIVES AND PROCESS OF THEIR PREPARATION

Carol Scolastico, Via Vallisneri 13B, Milan, Italy, and Giovanni Tronconi, Via 15 Martiri, Vimodrone (Milan), Italy

Division of Ser. No. 830,315, Sep. 2, 1977. This application Jul. 18, 1979, Ser. No. 58,677
Claims priority, application Italy, Sep. 7, 1976, 26950 A/76
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 9 Claims

1. Compounds of the formula



where
R is hydrogen or alkyl of 1 to 3 carbon atoms;
R^2 is hydrogen or methyl;
R^4 is hydrogen or alkyl of 1 to 3 carbon atoms;
m is 2, 3 or 4;
n is 1;
a is $-CH_2-CH_2-$;
b is $-CH_2-CH_2-$.

4,220,799

PROCESS FOR THE PREPARATION OF CONDENSATION PRODUCTS OF ACETOACETIC ESTERS AND ALDEHYDES

Rüdiger Berthold, Bad Soden am Taunus; Bernhard Mees, Eppstein, and Hartmut Heise, Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,737

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654850

Int. Cl.[2] C07C *69/66, 69/74*

U.S. Cl. 560—126 **15 Claims**

1. A process for making a condensation product selected from bis-β-ketocarboxylic acid esters and cyclic ketones which comprises reacting a lower alkanoylacetic acid lower alkyl ester with an alkanal of 1 to 10 carbon atoms at a temperature of $-40°$ to 120° C. in the presence of a catalyst which is a lower hydroxyalkyl tertiary amine.

4,220,800

OXIDATIVE ESTERIFICATION PROCESS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 5, 1978, Ser. No. 939,585

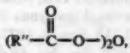
Int. Cl.[2] C07C *67/05*

U.S. Cl. 560—246 **8 Claims**

1. A process for the production of saturated vicinal esters which comprises reacting:

(a) at least one olefinic compound having at least 3 carbon atoms and having from 1 to 3 non-conjugated olefinic carbon-carbon double bonds, represented by the general formula RCH=CHR′ wherein R and R′ are selected from the group consisting of hydrogen, alkyl, alkenyl, alkadienyl, cycloalkyl, cycloalkenyl and cycloalkadieny radicals and wherein R can be the same or different from R′ and wherein R and R′ taken together can form an alkylene or alkenylene or alkadienylene radical thus forming a cyclic system with

(b) at least one of monocarboxylic acids having from 2 to 18 carbon atoms per molecule and the general formula R″COOH, dicarboxylic acids having from 3 to 18 carbon atoms per molecule and the general formula R‴(COOH)$_2$, and monocarboxylic acid anhydrides having the formula



wherein R″ is selected from the group consisting of alkyl, cycloalkyl, and aryl radicals and halogen, cyano and —COOR″′ substituted derivatives thereof, wherein up to 4 halogen, cyano or —COOR″′ substituents can be present in the R″ group, wherein R‴ is selected from the group consisting of alkylene, cycloalkylene and arylene radicals and halogen, cyano and —COOR″′ substituted derivatives thereof wherein up to 4 halogen, cyano or —COOR″′ substituents can be present in the R‴ group, and wherein R″′ is an alkyl or cycloalkyl radical having from 1 to 6 carbon atoms in the prsence of

(c) oxygen, and

(d) a catalytically effective amount of a catalyst consisting essentially of an oxide of boron or a boric acid under conditions which produce saturated vicinal esters.

4,220,801

PROCESS FOR MAKING 4-AROYL-SUBSTITUTED PHENOXYACETIC ACIDS

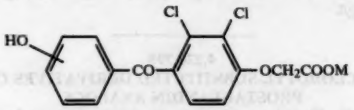
Roland L. Walters, Des Plaines, and Wayne R. Heitmann, Park City, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jul. 23, 1979, Ser. No. 59,823

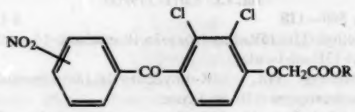
Int. Cl.[2] C07C *69/76*

U.S. Cl. 562—468 **13 Claims**

1. The process of manufacturing a compound of the formula



wherein M is hydrogen, an alkali or half of an alkali earth metal cation and said HO-group is in the p- or o-position, consisting essentially in treating an ester of the formula



wherein R is a loweralkyl or a phenyl group and the NO_2-group is in the p- or o-position, with 1.5–8 molar equivalents of an oxime of the formula R′R″C=NOM′ wherein R′ and R″ individually are hydrogen, phenyl or loweralkyl and M′ is an alkali or half an alkali earth metal cation, in the presence of DMF or DMSO at a reaction temperature of $-10°$ to $+130°$ C. for a period of at least 30 minutes.

4,220,802

PROCESS FOR THE PREPARATION OF ACRYLIC ACID

Shinichi Akiyama, and Haruhisa Yamamoto, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 597,163, Jul. 18, 1975, abandoned. This application Nov. 4, 1977, Ser. No. 848,668

Claims priority, application Japan, Jul. 26, 1974, 49-85763

The portion of the term of this patent subsequent to Feb. 21, 1995, has been disclaimed.

Int. Cl.[2] C07C *51/32, 57/04*

U.S. Cl. 562—535 **14 Claims**

1. A process for the preparation of acrylic acid which comprises reacting acrolein with molecular oxygen in the vapor phase in the presence of an oxidation catalyst composition having the following empirical formula

$$Mo_aP_bV_cL_dM_eO_f$$

wherein L is at least one element selected from the group consisting of Rb, Cs and K; M is at least one element selected from the group consisting of Sr, Nb, Cd, B, Zn and Pb; and a, b, c, d, e and f each represent the number of atoms of each

element; the atomic ratio of a:b:c:d:e being 12:0.1–8:0.1–8:0–.1–8:0–6; and f being the number of oxygen atoms determined by the valence requirements of the other elements present.

4,220,803

CATALYTIC DEHYDROGENATION OF ETHANOL FOR THE PRODUCTION OF ACETALDEHYDE AND ACETIC ACID

Arthur E. Marcinkowsky, Charleston, and Joseph P. Henry, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 27, 1978, Ser. No. 919,481
Int. Cl.[2] C07C *45/16, 47/06, 51/26, 53/08*
U.S. Cl. 562—538 **6 Claims**

1. A process for producing acetic acid and acetaldehyde by the vapor phase oxidative dehydrogenation of ethanol which comprises contacting a mixture of ethanol and oxygen with a catalyst consisting essentially of copper oxide and chromium oxide supported on an inert carrier, which catalyst is essentially free of barium, the mole ratio of oxygen to ethanol being from about 0.1 to about 0.5.

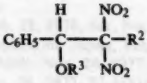
4,220,804

SYNTHESIS OF GEM-DINITROALKANES

Arnold T. Nielsen, China Lake, and Clifford D. Bedford, Claremont, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1978, Ser. No. 962,454
Int. Cl.[2] C07C *43/27, 79/10*
U.S. Cl. 568—584 **3 Claims**

1. A method for preparing compounds having the structure:



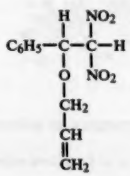
wherein R^2 is selected from the group consisting of H and CH_3 and wherein R^3 is selected from the group consisting of alkyl, alkenyl and aryl comprising the steps of:

A. Forming a solution containing an alcohol having the formula R^3OH wherein R^3 is selected from the group consisting of alkyl, alkenyl and aryl;

B. adding an unsaturated compound selected from the group consisting of ω-nitrostyrene and 2-nitro-1-phenyl-1-propene and tetranitromethane to the solution; and

C. allowing the unsaturated compound, the alcohol and the tetranitromethane to react.

3. A compound having the structure:



4,220,805

LINEAR DIMERS OF BISPHENOLS AND METHOD FOR MAKING

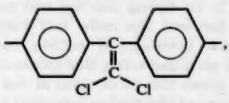
James C. Carnahan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 18, 1978, Ser. No. 942,956
Int. Cl.[2] C07C *41/00, 43/20*
U.S. Cl. 568—592 **9 Claims**

1. Bisphenols of the formula,

$$R^1—(OROH)_2,$$

where R is



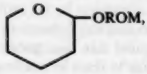
and R^1 is selected from divalent $C_{(1-12)}$ alkylene radicals and divalent $C_{(8-12)}$ arylene radicals.

4. A method for making bisphenols of the formula

$$R^1—OR—OH)_2,$$

which comprises

(1) effecting contact between a monocapped phenoxide salt of the formula,



and a dihalogenated compound of the formula,

$$R^1X_2,$$

in the presence of an inert organic solvent at temperatures up to 160° C. to produce a dicapped phenoxide reaction product,

(2) acidifying and agitating the resulting reaction mixture to effect the hydrolysis of the capping group to provide the diphenol reaction product and

(3) recovering the bisphenols from the mixture of (2),

where R is a $C_{(6-30)}$ divalent aromatic organic radical, R^1 is selected from divalent $C_{(1-12)}$ alkylene radicals and alkarylene radicals, X is halogen and M is an alkali metal ion.

4,220,806

PLURAL STAGES OF HYDROFLUORIC ACID ALKYLATION UTILIZING SEPARATED ACID PHASE AS CATALYST IN THE SUBSEQUENT STAGE

Michael Z. Mikulicz, Palatine, and James F. Himes, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Apr. 23, 1979, Ser. No. 32,611
Int. Cl.[2] C07C *3/54*
U.S. Cl. 585—716 **7 Claims**

1. A process for the alkylation of an isoparaffinic hydrocar-

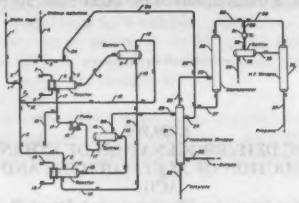
bon with an olefin-acting alkylating agent which comprises:

(a) commingling said isoparaffinic hydrocarbon and a first portion of said olefin-acting alkylating agent in a first alkylation reaction zone at alkylation reaction conditions and in contact with a hydrofluoric acid catalyst of at least 75 wt.% titratable acid and 5 wt.% or less water;

(b) separating the hydrofluoric acid phase from the reaction effluent of said first alkylation reaction zone effluent and recovering a hydrocarbon phase comprising alkylate and unreacted isoparaffinic hydrocarbon;

(c) commingling said hydrocarbon phase with a second portion of said olefin-acting alkylating agent in a second alkylation reaction zone at alkylation reaction conditions and in contact with said hydrofluoric acid phase separated from the effluent of said first alkylation reaction zone;

(d) separating the acid phase from the reaction effluent of said second alkylation reaction zone, and recycling the same to said first alkylation reaction zone; and,



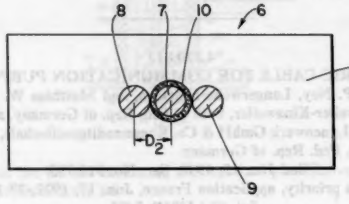
(e) recovering the alkylation product from the hydrocarbon phase separated in step (d).

4,220,807

TRANSMISSION CABLE

James Anastasi, Willimantic, and Thomas S. Redmerski, Mansfield Center, both of Conn., assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 12, 1978, Ser. No. 914,264
Int. Cl.[2] H01B 7/08
U.S. Cl. 174—36 2 Claims



1. An electrical signal transmission cable comprising:

a signal conductor; said signal conductor substantially surrounded by and in contact with a polymeric foam insulation; said polymeric foam insulation being constructed substantially of polypropylene wherein the foam bubble density is approximately 0.499 grams per cubic cm.;

at least one ground conductor located a predetermined distance from said signal conductor; said ground conductor acting as a shield for said signal conductor;

said at least one ground conductor and said at least one foam insulated signal conductor being embedded in an electrical insulation having a density greater than said foam insulation whereby the signal propagation velocity of said cable is substantially increased over a non-foam insulated cable and the predetermined distance between said at least one signal conductor and said at least one ground conductor is maintained substantially constant during normal use for maintaining a predetermined characteristic impedance for said cable.

4,220,808

MOUNTING DEVICE FOR COMPACT APPARATUS

Teizo Fujita, Ibaraki, Japan, assignor to Izumi Denki Corporation, Osaka, Japan

Filed Feb. 21, 1978, Ser. No. 879,529
Claims priority, application Japan, Feb. 24, 1977, 52-20009; Mar. 10, 1977, 52-26689; Nov. 24, 1977, 52-141365; Dec. 15, 1977, 52-152249; Nov. 24, 1977, 52-158162[U]; Nov. 24, 1977, 52-158163[U]; Nov. 26, 1977, 52-159062[U]; Dec. 20, 1977, 52-173376[U]; Dec. 20, 1977, 52-173377[U]; Dec. 29, 1977, 52-177506[U]; Dec. 29, 1977, 52-177507[U]; Jan. 7, 1978, 53-592[U]
Int. Cl.[2] H05K 5/02
U.S. Cl. 174—48 37 Claims

1. A device for mounting on a supporting panel means comprising:

an electrical apparatus enclosed in a casing of an insulating material;

said casing including a main body portion with a cavity containing component elements of said electrical apparatus and a hollow pillar-shaped portion extending from one external side of said main body portion, the hollow portion of said pillar-shaped portion being formed along a longitudinal axis of said pillar-shaped portion and communicating with said cavity of said main body;

said hollow pillar-shaped portion having its free end divided into a plurality of segments by a plurality of slots extending along said axis from said free end;

a first and a second set of segments in a predetermined number being selected among said plurality of segments, each of said first and said second set of segments having its free end integrally formed with a portion protruded outward thereby to form a step on the opposite end of said protruded portion to said free end, said protruded portion of each of said first and said second set of segments being arranged such that when said free end of said hollow pillar-shaped portion is registered with and pressed against a mounting hole preformed in the supporting panel means, in use, in order to fix said casing onto said panel means, said protruded portion will be pressed inwardly by the periphery of said mounting hole, thereby causing the segment associated with said protruded portion to bend elastically inward and such that said segment associated with said protruded portion will be restored to its original position after said protruded portion has passed through said mounting hole;

bias means located between said one external side of said main body and said step of each of said first set of segments for exerting a force to keep away said one external side of said main body and said supporting panel means from each other after said protruded portion of each of said first and said second set of segments has passed through said mounting hole in use, whereby said supporting panel means will be pressed into contact with said step of each of said first set of segments; and

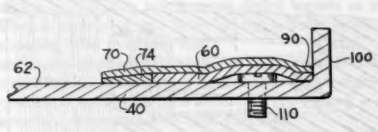
the length of said protruded portion of each of said second set of segments along said axis being shorter than that of said protruded portion of each of said first set of segments so that, in use, when said supporting means is pressed into contact with the step of each of said first set of segments, a gap will be formed between the supporting panel means and the step of each of said second set of segments.

4,220,809

PROTECTIVE MECHANISM FOR ELECTRONIC APPARATUS

William M. Hennessey, Somerville, and Frederick E. Bratro, Scotch Plains, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 2, 1979, Ser. No. 590
Int. Cl.[2] H05K 5/00
U.S. Cl. 174—52 R 4 Claims



1. Electronic apparatus comprising

a housing,

electronic circuitry within the housing,

a mounting plate as part of said housing, said plate having a keyslot and an inner surface and an outer surface, the inner surface of said plate facing the inside of said housing and the circuitry contained therein,

a first sheet of insulating material on the inner surface of said plate and overlying and covering said keyslot, and

a second sheet of relatively rigid material overlying said first sheet and secured to the inner surface of said plate along

all but a portion of its periphery whereby said first and second sheets can be pushed slightly away from said inner surface,

said first and second sheets forming a permanent blocking means for said keyslot whereby foreign objects cannot enter or leave said housing through said keyslot,

said first and second sheets being sufficiently yieldable to permit a mounting screw to be inserted into said keyslot from outside said housing and pressing against said first sheet.

4,220,810

PRINTED WIRING BOARD

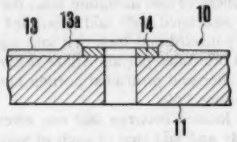
Minoru Arai, Tokyo, and Akio Baba, Fuchu, both of Japan, assignors to Tokyo Print Industry Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,499

Claims priority, application Japan, Jun. 1, 1978, 53-66202

Int. Cl.³ H05K *1/00*

U.S. Cl. 174—68.5 **8 Claims**



1. In a printed wiring board of the kind having an insulated baseboard, a conductive foil circuit disposed on at least one side surface of the baseboard, and a land to be soldered having a closed peripheral edge disposed at a predetermined position on said circuit, the improvement comprising a narrow non-planar raised portion of solder resist ink formed on said baseboard, said raised portion defining a ridge surrounding the peripheral at edge of said land, and a thin layer of solder resist ink covering said baseboard and said conductive foil circuit, exclusive of said at least one land and said ridge, said raised portion forming an extension of said thin layer and being raised above said thin layer.

4,220,811

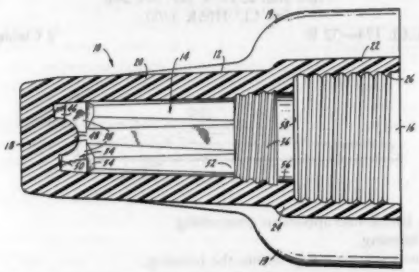
SCREW-ON ELECTRICAL CONNECTOR

William J. Scott, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Aug. 24, 1978, Ser. No. 936,587

Int. Cl.² H01R *5/12*

U.S. Cl. 174—87 **17 Claims**



1. In an article of manufacture, a connector for joining the ends of two or more electric wires, including a cap of a stiffly flexible insulating material having a generally central bore open at one end and closed by an end wall at the other end, a generally tapered wire coil in the bore, the outer end of the coil being toward the open end of the cap and in engagement with an area on the inner surface of the central bore, the inner end of the coil being in engagement with a second area on the inner surface of the central bore adjacent the end wall, the second area having a polygonal cross section, thereby presenting a number of flat side surfaces to the inner end of the coil, at least one turn of the coil at the inner end engaging and indenting a plurality of the flat side surfaces, and means in the cap engaging the coil to prevent the coil from turning in the cap when the connector is turned down on the wires.

4,220,812

ELECTRIC CABLE FOR COMMUNICATION PURPOSES

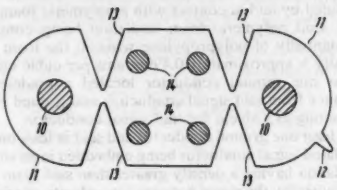
Robert P. Ney, Langerwehe-Heistern, and Matthias W. Horn, Eschweiler-Kinzweiler, both of Fed. Rep. of Germany, assignors to Lynenwerk GmbH & Co. Kommanditgesellschaft, Eschweiler, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,755

Claims priority, application France, Jun. 17, 1977, 77 18595

Int. Cl.² H01B *7/08*

U.S. Cl. 174—117 F **8 Claims**



1. An electric cable for communication purposes having a flat oblong shape and comprising a plurality of conductors spaced from each other in the transverse direction of said cable, several traction relief means comprising in combination therewith several strength carrier means of high strength fibers arranged symmetrically with regard to the longitudinal central plane of said cable and with regard to said conductors, and an enveloping substance selected from the group consisting of thermoplastic and elastomeric material forming a common housing having said conductors and strength carrier means positively embedded and oriented substantially linearly therein, said carrier means, when viewing a cross section of said cable, comprising two pairs of carrier members spaced from each other in the direction of height of said cable, the carrier members of each pair being located on an imaginary straight line substantially parallel to an imaginary line interconnecting said conductors, and also being spaced from each other in the transverse direction of said cable.

4,220,813

TERMINAL FOR MEDICAL INSTRUMENT

James C. Kyle, Mission Viejo, Calif., assignor to Medical Components Corp., Mission Viejo, Calif.

Filed Sep. 26, 1977, Ser. No. 836,657

Int. Cl.² H01B *17/26*; A61N *1/36*

U.S. Cl. 174—152 GM **41 Claims**

36. In combination for providing for the introduction of signals to a terminal lead in a heart pacemaker,

a lid for the heart pacemaker,

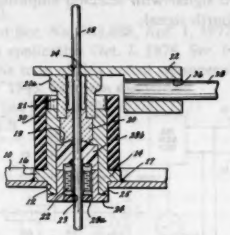
a terminal pin,

a conductive ferrule enveloping the terminal pin in spaced relationship to the terminal pin, the ferrule abutting the lid and being attached to the lid,

a catheter block disposed on the terminal pin in spaced relationship to the ferrule and the lid and attached to the terminal pin, and

insulating means disposed between the terminal pin and the

ferrule and between the ferrule and the catheter block and hermetically sealing the terminal pin relative to the ferrule



and the lid and insulating the terminal pin relative to the ferrule and the lid.

4,220,814

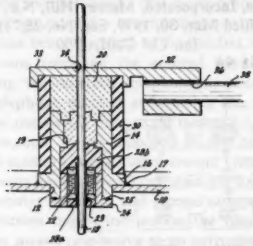
TERMINAL FOR MEDICAL INSTRUMENT AND METHOD OF ASSEMBLING THE TERMINAL

James C. Kyle, Mission Viejo, and Donald F. Cook, San Juan Capastrano, both of Calif., assignors to Medical Components Corp., Mission Viejo, Calif.

Filed Jan. 17, 1978, Ser. No. 870,192

Int. Cl.[2] H01B *17/26;* A61N *1/36*

U.S. Cl. 174—152 GM **40 Claims**



21. In combination for providing for the introduction of a terminal lead from a heart pacemaker into the body of a patient,

a terminal pin,

first support means having electrically conductive properties and spaced from the terminal pin,

a lid disposed in abutting relationship to the first support means,

an electrical body for supporting the terminal lead and coupled electrically to the terminal pin, and

insulating means disposed between the terminal pin and the first support means and hermetically sealing the terminal pin, the first support means and the electrical body.

4,220,815

NONPLANAR TRANSPARENT ELECTROGRAPHIC SENSOR

William A. Gibson, Lenoir City, and John E. Talmage, Jr., Oak Ridge, both of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Filed Dec. 4, 1978, Ser. No. 966,351

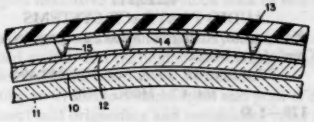
Int. Cl.[2] H04N *1/00;* G09B *7/00;* G08B *5/36*

U.S. Cl. 178—18 **6 Claims**

1. An improved electrographic sensor for disposing upon a nonplanar data-containing surface so as to permit generation of electrical signals corresponding to x- and y-coordinates of any portion of said data, said sensor having a transparent uniformly thick substrate with a top and a bottom face, a uniform transparent resistive layer adherently deposited on said top face, and means attached to said resistive layer for connecting to electrical circuits to produce uniform orthogonal electrical fields in said resistive layer, the improvement comprising:

a. said substrate being shaped whereby said bottom face closely conforms to said nonplanar data-containing surface;

b. a transparent cover sheet supported at a substantially uniform gap distance above said resistive layer;



c. a transparent conductive layer applied to said cover sheet on a surface facing said resistive layer; and

d. insulation islands having a height of from 0.0001 to 0.01 inches and a maximum transverse dimension of 0.002 to 0.02 inches uniformly distributed in said gap between said cover sheet and said resistive layer to maintain said uniform gap distance, the spacing between said insulation islands being 0.025 to 0.50 inches.

4,220,816

DIGITAL DUPLEX TRANSMISSION SYSTEM

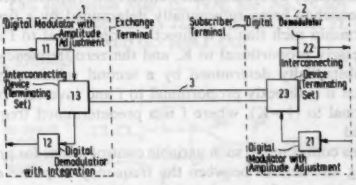
George A. Howells, Bishop's Stortford; James A. Murray, Sawbridgeworth, and Douglas E. Woodman, Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 11, 1979, Ser. No. 2,493

Claims priority, application United Kingdom, Jan. 17, 1978, 01789/78

Int. Cl.[2] H04J *3/06*

U.S. Cl. 370—24 **9 Claims**



1. A digital duplex transmission system comprising:

two terminals interconnected by a 2-wire transmission line;

first means disposed in one of said terminals coupled to said line for transmitting isochronous digital signals as pulse encoded signals of one type having a duty factor not exceeding 50% over said line;

second means disposed in the other of said terminals coupled to said line for transmitting isochronous digital signals as pulse encoded signals of a different type having a duty factor not exceeding 50% over said line;

said one type of encoded signals and said different type of encoded signals having the same digit repetition rate;

third means disposed in said one of said terminals coupled to said line to receive said different type of encoded signals from said line; and

fourth means disposed in said other of said terminals coupled to said line to receive said one type of encoded signals from said line;

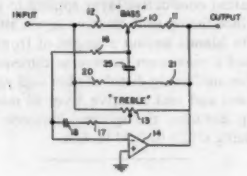
the timing of one of said one type of encoded signals and said different type of encoded signal transmitted from one of said one of said terminals and said other of said terminals having a predetermined fixed relationship with the other

of said one type of encoded signals and said different type of encoded signals received at said one of said one of said terminals and said other of said terminals such that the periods of zero signal in said one of said one type of encoded signals and said different type of encoded signals coincide with the significant portions of said other of said one type of encoded signals and said different type of encoded signals.

4,220,817
AUDIO PLAYBACK SYSTEMS

Frank S. Kampmann, Arlington, Mass., assignor to Apt Corporation, Cambridge, Mass.

Filed Sep. 15, 1978, Ser. No. 942,494
Int. Cl.[2] H03G *5/16*
U.S. Cl. 179—1 D **9 Claims**



1. Circuitry for use over the audio frequency range and responsive to an audio input signal for producing an audio output signal, said circuitry comprising

bass control circuitry responsive to said input signal including variable control means having variable impedance means, the variable impedance of which is represented by a parameter, K, capable of varying over a preselected range, for selectively controlling the frequency response of said circuit in the bass region of said audio frequency range substantially in accordance with a transfer function defined by a pole frequency and a zero frequency, the pole frequency being substantially determined by a first relationship such that it is directly proportional to f and inversely proportional to K, and the zero frequency being substantially determined by a second relationship such that it is directly proportional to f and inversely proportional to (1−K), where f is a predetermined frequency; and

means connected to such variable control means for preventing interactions between the frequency response of said circuitry at frequencies above said bass region and the frequency response of said circuitry in said bass region due to said selective controlling of the frequency response in said bass region.

4,220,818
AM STEREO TRANSMITTER

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed May 21, 1979, Ser. No. 41,165
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GS **8 Claims**

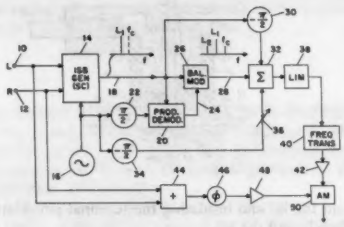
1. In an independent sideband (ISB) AM stereo transmitter, a phase modulator, comprising:

an ISB, suppressed carrier signal generator, responsive to supplied stereo signals L and R, and a supplied carrier signal, for modulating said carrier and generating a first signal having upper and lower first order sidebands separately modulated by said L and R signals and a suppressed carrier;

means, responsive to said first signal and said carrier signal, for demodulating the quadrature component of said first signal to form a second signal;

means for modulating said first signal with said second signal to form a third signal, said third signal having carrier and first and second order sideband components;

means for combining said carrier signal, said first signal and said third signal with selected amplitudes and phases to form a fourth signal;

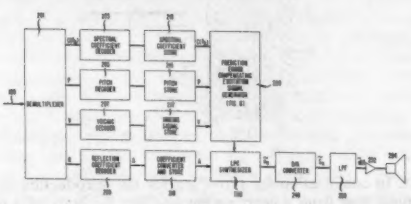


and a limiter for removing amplitude modulation components of said fourth signal thereby to provide a phase modulated signal having a carrier and first and second order sideband components.

4,220,819
RESIDUAL EXCITED PREDICTIVE SPEECH CODING SYSTEM

Bishnu S. Atal, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 30, 1979, Ser. No. 25,731
Int. Cl.[2] G10L *1/00*
U.S. Cl. 179—1 SA **10 Claims**



1. A speech communication circuit comprising:

a speech analyzer including means for partitioning an input speech signal into time intervals;

means responsive to the speech signal of each interval for generating a set of first signals representative of the prediction parameters of said interval speech signal, a pitch representative signal and a voicing representative signal;

and means jointly responsive to said interval speech signal and said interval first signals for generating a signal corresponding to the prediction error of the interval;

and a speech synthesizer including an excitation generator responsive to said pitch and voicing representative signals for producing an excitation signal;

and means jointly responsive to said excitation signal and said first signals for constructing a replica of said input speech signal;

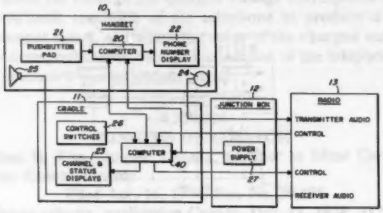
characterized in that said speech analyzer further includes means (**124, 126**) responsive to said prediction error signal for generating a set of second signals representative of the spectrum of the interval prediction error signal; and said synthesizer excitation generator (**220**) is jointly responsive to said pitch representative, voicing representative and second signals to produce a prediction error compensating excitation signal.

4,220,820

CONTROL CIRCUITRY FOR A RADIO TELEPHONE

Thomas O. Mallien, II, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 783,888, Apr. 1, 1977, Pat. No. 4,122,304. This application Oct. 2, 1978, Ser. No. 948,356
The portion of the term of this patent subsequent to Oct. 24, 1995, has been disclaimed.
Int. Cl.[2] H04M *11/00, 1/27*
U.S. Cl. 179—2 EB 30 Claims



1. A control circuitry for a radio telephone transceiver including a transmitter, a receiver, a supervisory unit for providing supervisory signalling between the radio telephone transceiver and a base station, a cradle, and a handset having a pushbutton dial for entering the digits of a telephone number, said control circuitry comprising:

first computer means having a first memory for storing a first control program, and a second memory, said first computer means being disposed in the handset, said first computer means receiving the entered telephone number, converting the received telephone number to a related coded telephone number and storing the related coded telephone number in the second memory;

second computer means disposed in the transceiver and having a memory for storing a second control program;

data bus means having at least one data line for coupling said first computer means to said second computer means;

send pushbutton means located on the handset, said first computer means responsive to an activation of said send pushbutton means for reading out from the second memory the stored related coded telephone number, and coupling in succession the digits of the read-out related coded telephone number to said data bus means, said second computer means receiving the digits of the related coded telephone number from said data bus means and outpulsing the received digits of the related coded telephone number to the supervisory unit.

4,220,821

OFF-HOOK INITIATED DEMAND ASSIGNMENT COMMUNICATIONS

Jerome G. Lucas, McLean, Va., assignor to Communications Satellite Corporation, Washington, D.C.

Filed Jun. 16, 1978, Ser. No. 916,392
Int. Cl.[2] H04M *7/16*
U.S. Cl. 370—110 11 Claims

1. A method of establishing a communication link between a calling switch and a called switch through originating and terminating relay stations via selected channels from a pool of demand assigned channels between said originating and terminating relay stations, comprising the steps of:

(a) generating, on a selected one of a plurality of originating trunks between said calling switch and an originating earth station, first supervisory signals indicative of the on-hook or off-hook state of said trunk, each of said trunks being dedicated to communications destined for a particular called switch via a particular terminating relay station;

(b) monitoring said selected trunk to detect a first supervisory signal indicative of the off-hook state of said selected trunk;

(c) determining at said originating relay station the particular called switch and particular terminating relay station to which said selected trunk is dedicated;

(d) selecting an available channel from said pool of channels to connect said originating and terminating relay stations;

(e) determining at said terminating relay station the particular called switch to which the selected channel is to be connected; and

(f) connecting said selected channel to said calling and called switches.

10. The method according to claim 1 further comprising the steps of:

(a) sending a signalling message from said calling to said called switch, said signalling message indicating the address of a second called switch;

(b) selecting a channel from said called switch to said second called switch in order to form a calling switch-to-called switch-to-second called switch communications link; and

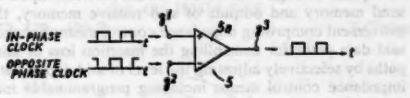
(c) disconnecting said called switch in order to form a calling switch-to-second called switch communications link.

4,220,822

TIME DIVISION MULTIPLEX TRANSMISSION SYSTEM

Ituo Kawai, Kobe, and Hisaharu Maeda, Osaka, both of Japan, assignors to Terasaki Denki Sangyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 780,114, Mar. 22, 1977, abandoned. This application Mar. 12, 1979, Ser. No. 19,409
Claims priority, application Japan, Apr. 30, 1976, 51/49635
Int. Cl.[2] H04J *3/08*
U.S. Cl. 370—83 28 Claims



1. A time division multiplex transmission system for communication of a data signal including a plurality of bits in a time division multiplex manner under common system clock control, comprising

a common system clock generating means for generating two-phase clock pulses including a first train of clock pulses of one phase and a second train of clock pulses of opposite phase,

clock pulse t.ansmission path means coupled to said common system clock generating means for separately transmitting said first train of one phase clock pulses and said second train of opposite phase clock pulses of said two-phase clock pulses,

data signal transmission path means for transmitting said data signal,

at least one transmitter coupled to said clock pulse transmission path means and said data signal transmission path means for transmitting said first and second trains of clock pulses and said data signal, said at least one transmitter comprising means connected to said common system clock generating means for receiving said two-phase clock pulses and for computing a differential value of said first train of one phase clock pulses and said second train of

opposite phase clock pulses of said two-phase clock pulses for providing a train of single phase clock pulses, and means responsive to said train of single phase clock pulses for transmitting said data signal in a time division multiplex fashion over said data signal transmission path means, and

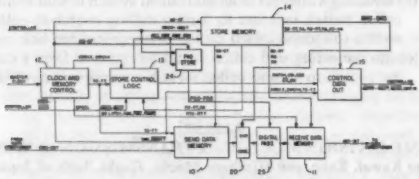
at least one receiver coupled to said clock pulse transmission path means and to said data signal transmission path means for receiving said first and second trains of clock pulses and said data signal, said at least one receiver comprising means for computing a differential value of said first train of one polarity clock pulses and said second train of opposite polarity clock pulses for providing a train of single phase clock pulses, and means responsive to said train of single phase clock pulses for receiving said data signal in a time division multiplex fashion from said data signal transmission path means.

4,220,823

SELECTIVELY CONTROLLED DIGITAL PAD

Bruce G. Littlefield, Honeoye Falls, N.Y., assignor to Stromberg-Carlson Corporation, Tampa, Fla.

Filed Jul. 21, 1978, Ser. No. 927,067
Int. Cl.[2] H04M *1/76*
U.S. Cl. 179—16 F **14 Claims**



1. In a digital transmission system including a send memory, a receive memory, transfer means connecting said send memory to said receive memory and memory control means for selectively effecting transfer of digital data stored in addressable memory locations of said send memory into selected memory locations of said receive memory to establish selective data paths through said transfer means between inputs of said send memory and outputs of said receive memory, the improvement comprising impedance control means connected in said data paths for controlling the insertion loss of said data paths by selectively adjusting the level of said digital data, said impedance control means including programmable memory means for storing a range of adjusted digital values corresponding to a range of levels of digital data carried by said data paths, and means for applying the digital data to said programmable memory means as addresses for the stored adjusted digital values.

4,220,824

INTERFACE LINKING SYNCHRONOUS SENSE AND DRIVE MATRICES OF TELEPHONE SYSTEM WITH A PROCESSOR OF SIGNALIZATION DATA

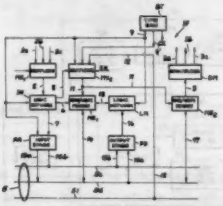
Michele Castriotta, and Spiridione De Micheli, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 14, 1978, Ser. No. 886,526
Claims priority, application Italy, Mar. 14, 1977, 67551 A/77
Int. Cl.[2] H04Q *3/56*
U.S. Cl. 179—18 J **10 Claims**

1. In a telecommunication system wherein a processor receives information on the state of circuit points periodically scanned by respective sensors identified by address codes read out in corresponding time slots of an operating cycle of a time base, in combination:

incoming-signal memory means with sections respectively identified by the address codes of corresponding sensors for the storage of evaluation criteria pertaining to the associated circuit points, said address codes arriving at an address input of said incoming-signal memory means;

logical circuitry connected to said sensors for receiving signal samples therefrom in corresponding time slots under the control of said time base, said logical circuitry being further connected to said incoming-signal memory means for evaluating the received signal samples and converting same into change-of-state signals on the basis



of the evaluation criteria stored in respective sections of said incoming-signal memory means;

output means controlled by said time base and connected to said logical circuitry for delivering said change-of-state signals together with the corresponding address codes to said processor; and

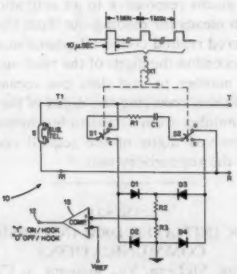
updating means in said logical circuitry connected to said processor for modifying the evaluation criteria stored in any section of said incoming-signal memory means.

4,220,825

TELEPHONE STATUS MONITOR CIRCIT

Robert J. Fahey, Burlington, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 4, 1978, Ser. No. 965,809
Int. Cl.[2] H04M *3/22*
U.S. Cl. 179—18 FA **8 Claims**



1. A telephone status monitor circuit for determining the on/hook and off/hook conditions of a telephone connected across tip and ring terminals of a telephone system, said tip and ring terminals having a voltage thereacross of a value corresponding to the on/hook condition or off/hook condition of the telephone, said status monitor circuit comprising:

control means adapted to receive a series of spaced pulses and operative in response to said pulses to be actuated between first and second operating states in accordance with said pulses;

charging circuit means arranged when the control means is in its first operating state to be placed by the control means in circuit with the tip and ring terminals and when the control means is in its second operating state to be

removed by the control means out of circuit with the tip and ring terminals;

said charging circuit means being operative when coupled in circuit with the tip and ring terminals by the control means to be charged to the value of the voltage then present across the tip and ring terminals; and

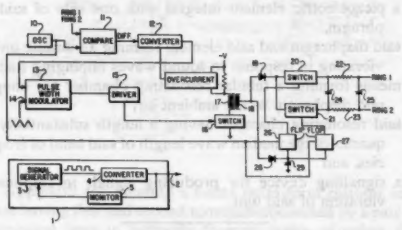
status circuit means arranged when the control means is in its second operating state to be connected by the control means in circuit with the charging circuit means, said status circuit means being operative when connected with the charging circuit means to examine the value of voltage to which the charging circuit means has been charged and when the value of the charged voltage corresponds to an on/hook condition of the telephone to produce a first output signal, and when the value of the charged voltage corresponds to an off/hook condition of the telephone to produce a second output signal.

4,220,826

RINGING GENERATOR

William B. Kiss, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Apr. 16, 1979, Ser. No. 30,196
Claims priority, application Canada, Dec. 11, 1978, 317680
Int. Cl.[2] H04M *5/00*
U.S. Cl. 179—51 AA **12 Claims**



1. A ringing signal comprising:

(a) means for providing a variable pulse width signal,

(b) means for converting the variable pulse width signal to an output signal of the ringing signal supply at a ringing frequency,

(c) means for monitoring the output signal of the ringing signal supply and for determining any variance of its waveshape from a predetermined waveshape,

(d) means for varying the width of the pulses in the waveform of the variable pulse width signal in response to said variance so as to render said output signal to the form of said predetermined waveshape.

4,220,827

TELEPHONE SIGNALING CIRCUIT

Edmund T. Burke, West Long Branch, and David F. Jones, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Murray Hill, N.J.

Filed Feb. 21, 1979, Ser. No. 13,566
Int. Cl.[2] H04Q *5/18*
U.S. Cl. 179—99 LS **20 Claims**

6. In a key telephone system (KTS2) including a key telephone line circuit (LC1) connected to a key telephone station set (KS1), a telephone signaling interface circuit (I1) adapted to connect between said line circuit and said key telephone station set, said interface circuit arranged for interacting with signaling leads (L, RC, A) leading from said line circuit characterized in that

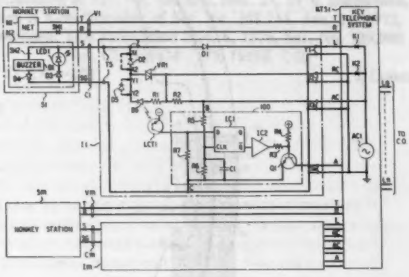
said signaling interface circuit (I1) is connected by a signaling pair (C1) to a station set (S1), said signaling interface including means for connecting to the "L", "RC" and "A" leads of said line circuit,

means for connecting to an "AC" lead of an alternating voltage ringing supply (AC1) of said key telephone system,

first switching means (D1) for obtaining a first polarity of voltage from said "L" lead,

second switching means (D6, D2) for obtaining a second polarity of voltage from said "AC" lead,

third switching means (D2) for obtaining a second polarity of voltage from said "RC" lead,



means for combining (Z) signals from said first, second and third switching means into a composite signal for transmission over said siganling pair to said telephone station, and

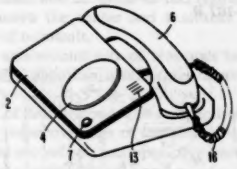
means for detecting (100) continuity of current flow of said second polarity of voltage over said signaling pair to said telephone station, and for converting said detected signal to a supervision signal on said "A" lead.

4,220,828

TELEPHONE SUBSET

Hugo Ruzic, Leonberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 888,903, Mar. 22, 1978, abandoned. This application Jan. 8, 1979, Ser. No. 1,813
Int. Cl.[2] H04M *1/02*
U.S. Cl. 179—100 D **5 Claims**



1. A telephone subset having at least an electronic ringer, a hookswitch, selector-switch equipment, repeating coil, handset cord and line cord, connectors and pushbutton keys comprising:

a box-like housing member having an opening in a frontal sloping surface thereof;

a control panel disposed to close said opening and to be detachably secured to said member; and

a printed circuit board supported from said control panel in a spaced relation thereto;

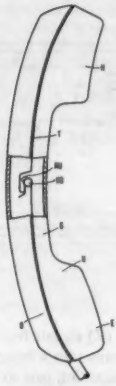
only said equipment, said ringer and said keys being directly secured to said panel and said hookswitch, said repeating coil and said connectors being mounted on said board.

4,220,829

TELEPHONE HANDSET

Hugo Ruzic, Leonberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 9, 1979, Ser. No. 11,017
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1978, 2806744
Int. Cl.[2] H04M *1/03, 1/02;* B65D *1/34*
U.S. Cl. 179—103 4 Claims



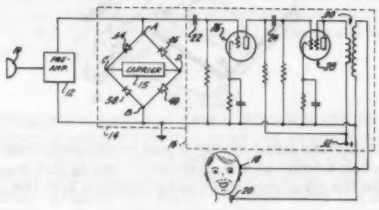
1. A telephone handset consisting of a lower housing part comprising the caps for accommodating the receiver and microphone capsules, and of an upper housing part which are both connected to one another by a bayonet joint, and having a bent parting line extending between both parts in the longitudinal direction, characterized in that the radius of the parting line (T) of the upper part (O) of the housing is smaller than the radius of the parting line of the lower part (U) of the housing, and that in the centre, on each side-wall (S) of the housing parts there is provided one bayonet joint each.

4,220,830

HEARING AID WITH MODULATED SUPPRESSED CARRIER SIGNAL

Curtiss R. Schafer, Newtown, Conn., assignor to Electro-Physical Research, Incorporated, Fort Lee, N.J.

Filed Aug. 4, 1978, Ser. No. 931,023
Int. Cl.[2] H04R *25/00*
U.S. Cl. 179—107 R 6 Claims



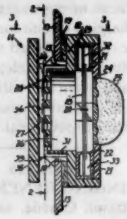
1. A hearing aid including a source of audio signals representing a spectrum of the sounds to be heard, a carrier-frequency signal source, a suppressed-carrier modulator having input couplings to said audio signal source and to said carrier-frequency signal source and having output signal means at which a modulated suppressed-carrier signal appears, and means for impressing the modulated suppressed-carrier output signal of said modulator on the person of the user, said last-named means including at least an electrode adapted to bear against the user's head.

4,220,831

INTRUSION SENSING DEVICE

Henry R. Zink, P.O. Box 459, Lake Arrowhead, Calif. 92352

Filed Jul. 17, 1978, Ser. No. 925,279
Int. Cl.[2] H04R *17/00;* G08B *13/00*
U.S. Cl. 179—110 A 9 Claims



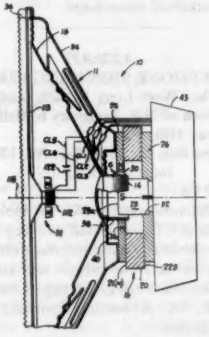
1. An intrusion-sensing apparatus for sensing a narrow band of intrusion sound frequencies and excluding others and for signaling the occurrence of said sound frequencies comprising;
a thin metallic diaphragm,
a piezoelectric element integral with one side of said diaphragm,
said diaphragm and said element forming a vibratile unit for vibrating in response to sound waves impinging thereon,
means forming a tubular resonating chamber for coupling said diaphragm to the ambient air,
said resonating chamber having a length substantially one quarter of the median wave length of said band of frequencies, and
a signalling device for producing signals in response to vibration of said unit.

4,220,832

TWO-WAY SPEAKER WITH TRANSFORMER-COUPLED SPLIT COIL

Martin J. Nagel, Russell Township, Geauga County, Ohio, assignor to Tenna Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 924,638, Jul. 14, 1978, which is a continuation-in-part of Ser. No. 746,796, Dec. 2, 1976, Pat. No. 4,130,725. This application Feb. 8, 1979, Ser. No. 10,502
Int. Cl.[2] H04R *1/26;* H01F *5/00*
U.S. Cl. 179—115.5 PS 9 Claims



1. In a power amplifier and two-way transducer unit comprising a first transducer, a magnet assembly defining a gap across which a magnetic flux extends to form a magnetic field,

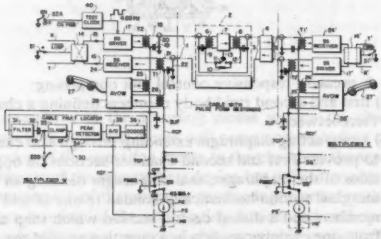
two wire voice coils of substantially identical helixes concentrically wound and secured to said first transducer and movable in said gap, means biasing said coils to a location centrally of the useful magnetic field, and an amplifier circuit directly coupled to said coils for alternately electrically energizing the moving said coils, the improvement wherein the unit includes a second transducer with a second magnetic gap and a third wire voice coil located within the second gap electrically connected to said two voice coils to move in response to energization by said circuit.

4,220,833

LOCATION OF A FAULTY PULSE FORM RESTORER IN A CABLE SYSTEM

Harry E. Wert, Winter Park, and Richard A. Branham, Orlando, both of Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,761
Int. Cl.³ H04J *3/14*
U.S. Cl. 179—175.31 R **18 Claims**



1. Apparatus for isolating a faulty pulse form restorer in a system having first and second terminals connected by a pair of transmission lines to normally transmit trains of pulses full duplex from sending means in each terminal to receiving means in the other terminal, with each transmission line having restorer units at intervals to regenerate the form of the pulses, power means to supply direct current from a terminal over a transmission line to provide power to the restorer units, each restorer unit having fault means which responds to the absence of a train of pulses to change by a fixed value the resistance of the direct current path through that restorer unit;

said apparatus comprises:

loop switching means operated for a test mode at the second terminal to couple the train of pulses from its receiving means to its sending means, and to make a direct current connection between the two transmission lines, so that a train of pulses from the sending means of the first terminal over one transmission line is returned over the other transmission line, direct current from the power means of the first terminal flows through the two transmission lines in series, and there is a chain of restorer units starting at the sending means of the first terminal out over the one transmission line and continuing back over the other transmission line;

test clock means to interrupt the train of pulses in the sending means of the first terminal to have repetitive predetermined on and off intervals, whereby during the off intervals all restorer units of the two transmission lines have said change by a fixed value of the resistance of the direct current path, and during the on intervals only a faulty restorer unit and subsequent restorer units in the chain have said change;

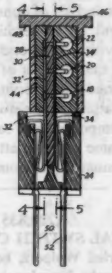
and fault locator means coupled to said power means in the first terminal to make a measurement which is a function of the difference between the resistance in the direct current path through the two transmission lines for said on and off intervals, and display means coupled to the detector means to display a number dependent on said measurement which indicates which restorer unit is faulty.

4,220,834

TELEPHONE LINE ATTENUATOR NETWORK AND ATTENUATOR PAD THEREFOR

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Kentrox Industries, Inc., Portland, Oreg.

Continuation of Ser. No. 534,630, Dec. 19, 1974, abandoned, which is a continuation of Ser. No. 262,714, Jun. 14, 1972, abandoned. This application Nov. 8, 1976, Ser. No. 739,980
Int. Cl.² H04M *1/76*; H05K *7/02*
U.S. Cl. 179—190 **2 Claims**



1. A telephone line attenuator network assembly comprising:

(a) a fixed attenuator section including

(1) a first set of three equally laterally spaced terminals mounted on a supportive structure and securing among them a first pair of first and second electrical resistors of equal value, one of said resistors being connected between a first outer and the center of said terminals, and the other of said resistors being connected between the center and a second outer of said terminals,

(2) a second set of three equally laterally spaced terminals mounted on said supportive structure transversely from but aligned uniformly with said first set of terminals and securing among them a second pair of third and fourth electrical resistors each having the same value as the resistors of said first pair, one of said resistors being connected between a first outer and the center of said second set of terminals, and the other of said resistors being connected between the center and a second outer of said second set of terminals,

(3) said first and second sets of terminals being arranged symmetrically about an axis located centrally therebetween,

(4) a first pair of flexible conductors respectively electrically coupled to respective ones of said first outer terminals of said first and second sets and respective ones of a first pair of telephone circuitry signal lines,

(5) a second pair of flexible conductors respectively electrically coupled to respective ones of said second outer terminals of said first and second sets and respective ones of a second pair of telephone circuitry signal lines, and

(b) an attenuator pad component removably connected to said fixed attenuator section and including

(1) a first set of three contacts mounted on a second supportive structure,

(2) a second set of three contacts mounted on said second supportive structure, said sets of contacts being arranged on said second structure such that, when said attenuator pad component is removably connected to said fixed attenuator section, first, second and third contacts of said first set of contacts are aligned and in contact with said first outer, center and second outer terminals of said first

set of terminals, respectively, and first, second and third contacts of said second set of contacts are aligned and in contact with said first outer, center and second outer terminals of said second set of terminals, respectively,

(3) a fifth electrical resistor connected between said first and third contacts of said first set,

(4) a sixth electrical resistor of the same value as the fifth resistor connected between said first and third contacts of said second set, and

(5) a seventh electrical resistor connected between said second contact of said first set and said second contact of said second set, whereby said attenuator pad component may be removably connected to said fixed attenuator section in either of two orientational positions differing by 180°, the first said position being with said first set of contacts aligned and in contact with said first set of terminals and said second set of contacts aligned and in contact with said second set of terminals, and the second said position being with said second set of contacts aligned and in contact with said first set of terminals and said first set of contacts aligned and in contact with said second set of terminals, said attenuator network comprised of said attenuator pad component and said fixed attenuator section providing the same value of attenuation in each said position of said attenuator pad component.

4,220,835

ELECTRICAL SWITCH CONSTRUCTION

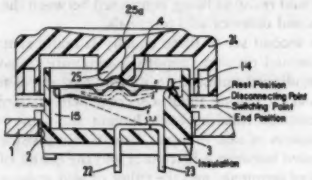
Werner Storz; Siegfried Wolpert, both of Rietheim-Weilheim, and Kuno Futterknecht, Emmingen-Liptingen, all of Fed. Rep. of Germany, assignors to J. & J. Marquardt, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,015

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740902

Int. Cl.² H01H *21/44*

U.S. Cl. 200—67 DB **11 Claims**



1. An electrical switch, comprising, a casing of non-conductive material having first and second spaced apart upstanding supports, a contact plate of electrically conductive material having an intermediate spring portion with an outwardly extending arcuate intermediate portion thereof centrally disposed intermediate its length, a bridging member on each side of said spring portion, and an end portion on each end interconnecting said spring portion with said bridging members, said spring portion having each end portion supported on respective ones of said upstanding supports, movable contact means connected with said contact plate and being movable by deflection of said spring portion, said spring portion extending from said bridging members in an outwardly biased condition in the direction of said arcuate portion, fixed contact means mounted in said casing in alignment with the path of movement of said movable contact means, and an actuator mounted in said casing for movement toward and away from said spring portion and engageable with said arcuate portion of said spring portion to displace it against the biasing thereof to move said movable contact means into engagement with said fixed contact means, said end portions of said contact plate remaining supported on said supports, said biasing being sufficient to return said spring portion to its outwardly biased condition after said actuator is released.

4,220,836

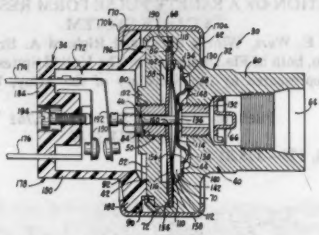
PRESSURE RESPONSIVE CONTROL UNIT EMPLOYING SNAP ACTION DIAPHRAGM

Harold E. Hersey, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed Dec. 20, 1978, Ser. No. 971,517

Int. Cl.² H01H *35/34*

U.S. Cl. 200—83 P **14 Claims**



1. A pressure responsive control unit comprising:

(a) first and second rigid body members defining a chamber therebetween;

(b) a snap acting diaphragm extending through said chamber to provide first and second chamber sections on opposite sides of the diaphragm, said diaphragm defining an outer marginal section hermetically bonded to one of said body members and a dished central section which snap moves from one chamber section in a direction toward the other depending on differential pressure acting on the diaphragm; and,

(c) a pressure event controlling mechanism comprising

(i) a diaphragm support plate in one of said chamber sections, said support plate having an outer peripheral portion engaging said diaphragm marginal section and a resiliently deflectable central portion defining a smoothly concave face extending substantially continuously across said chamber and engageable at least in part by said diaphragm central section when dished toward said one chamber section;

(ii) an adjusting member reacting between said other body member and said support plate central portion, said adjusting member movable to resiliently deflect and move said support plate central portion relative to the support plate outer peripheral portion to govern the extent of diaphragm deflection toward said one chamber section and the differential pressure level at which said diaphragm snap moves away from said one chamber section;

(d) said body members defining bearing faces which tightly compress and support said marginal section and peripheral portion therebetween.

4,220,837

BI-SWITCH CONSTRUCTION HAVING AN AUXILIARY INTERRUPTING DEVICE ASSOCIATED THEREWITH

Charles D. Bice, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

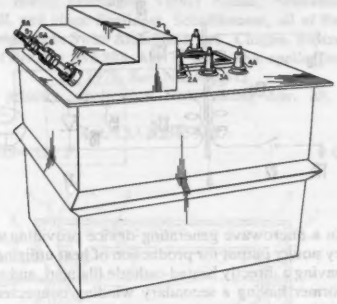
Continuation of Ser. No. 547,845, Feb. 6, 1975, abandoned, which is a continuation of Ser. No. 284,520, Aug. 28, 1972, abandoned. This application Jan. 6, 1977, Ser. No. 757,421

Int. Cl.² H01H *33/12*

U.S. Cl. 200—146 R **47 Claims**

1. A switch including a first terminal means, means defining a second terminal means spaced away from said first terminal means, a movable conducting member, actuating means for

moving the movable conductor member to thereby electrically interconnect the first and second terminal means, an interrupting device having separable contacts, means defining an auxiliary terminal associated with said interrupting device, one of said separable contacts of said interrupting device being electrically connected to said second terminal means and the other separable contact of said interrupting device being connected to the auxiliary terminal of the interrupting device, operating means for opening and closing the separable contacts of the interrupting device, the said operating means being mechani-



cally responsive to the actuating means so that the closing motion of the actuating means will cause corresponding closing motion of the operating means to thereby close the separable contacts of the interrupting device but only after contacting engagement of the movable conducting member with the auxiliary terminal of the interrupting device, and said operating means effecting a reopening of the separable contacts of the interrupting device following an electrical interconnection of the movable conducting member with the said second terminal means.

4,220,838

GAS-BLAST SWITCH

Richard Thaler, Unterentfelden; John Montigel, Aarau; Hans-Ulrich Meier; Moritz Jungo, both of Oberentfelden; Christian Tschannen, Unterentfelden, and Tibor Morva, Oberentfelden, all of Switzerland, assignors to Sprecher & Shuh AG, Aargau, Switzerland

Filed Nov. 27, 1978, Ser. No. 964,081

Claims priority, application Switzerland, Dec. 12, 1977, 15199/77

Int. Cl.[2] H01H *33/82*

U.S. Cl. 200—148 A **8 Claims**

1. A gas-blast switch comprising:

a hollow support insulator having an internal space;

at least one switching compartment housing having a hollow insulator and supported on said support insulator;

said switching compartment housing containing a blast chamber;

a set of fixed contacts arranged in said switching compartment housing;

a set of movable contacts arranged in said switching compartment housing;

said sets of fixed and movable contacts being surrounded by said blast chamber;

a blast nozzle for extinguishing gas operatively associated with said set of movable contacts;

a pump device with which there is operatively connected said blast nozzle;

said pump device comprising a pump cylinder surrounding a pump chamber and movable in conjunction with the movable contacts;

said pump device further including a stationary pump piston;

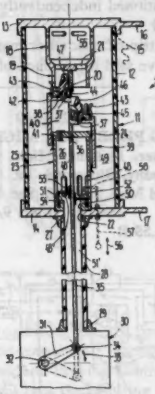
said pump cylinder being displaceably mounted upon said stationary pump piston;

a nonreturn valve cooperating with the pump chamber and opening into said pump chamber;

pressurized extinguishing gas being sucked-up into the pump chamber by means of the nonreturn valve during the course of a switching-in stroke of the gas-blast switch;

a supply compartment;

said pump chamber being connected by means of said nonreturn valve with said supply compartment;



inlet means for flow communicating said supply compartment with said blast chamber and the internal space of said support insulator;

valve means responsive to the pressure increase of the extinguishing gas in the blast chamber;

said valve means, upon response thereof, interrupting the flow communication between the internal space of the support insulator and the inlet means.

4,220,839

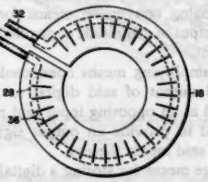
INDUCTION HEATING COIL FOR FLOAT ZONE MELTING OF SEMICONDUCTOR RODS

Noel De Leon, Frederikssund, Denmark, assignor to Topsil A/S, Denmark

Filed Jan. 5, 1978, Ser. No. 867,202

Int. Cl.[3] H05B *5/00*

U.S. Cl. 219—10.49 R **14 Claims**



1. In a method for forming an induction heating coil oriented about an axis and having first and second major surfaces spaced apart in the direction of said axis for the float zone melting of crystalline material the improvement which comprises altering said major surfaces of said coil to change the current distribution on said major surfaces by providing a first set of slots into said first surface but not extending to a depth in the direction of said axis to intersect said second major surface and a second set of slots into said second major surface but not extending to a depth in the direction of said axis to intersect said first major surface.

7. An induction heating coil for the crucible free melting of semiconductor materials comprising:

a single-turn pancake coil formed of copper, said coil having top and bottom surfaces;

radially directed saw slots positioned near the outer periphery of said top surface of said coil, said slots extending into said top surface but not through the total thickness of said coil;

radially directed saw slots positioned in the central portion of said bottom surface of said coil, said slots in said bottom surface positioned independently of said slots in said top surface; and

a concentric strip of conductor material affixed to and protruding above said top surface of said coil.

4,220,840

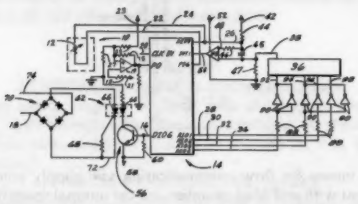
PULSING PROBE FOR MICROWAVE OVEN

Charles E. Barker, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 19, 1978, Ser. No. 907,670

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B **8 Claims**



1. A control circuit sensitive to the presence of a thermistor probe in a microwave oven cyclically actuated by a magnetron to achieve a predetermined desired temperature comprising:

a timing circuit for intermittently energizing said thermistor probe to elicit a probe voltage drop signal therefrom for a short interval by cyclical application of a preset d.c. voltage thereto, and thereafter de-energizing said thermistor probe for a long interval by removal of said d.c. voltage therefrom, wherein the duration of energization during said short interval is no greater than 500 microseconds and no greater than 0.6 percent of the duration of an energization and de-energization cycle including:

clock pulse input means,

a pulse counting circuit for counting clock pulses during said energization interval and for providing a multibit binary output indicative of most recent pulse count,

digital to analog conversion means for producing a d.c. voltage output of magnitude controlled by the most recent pulse count,

differential amplifying means connected to receive as one input said output of said digital to analog conversion means and as an opposing input said probe voltage drop signal, and to provide an output signal identifying the greater of said inputs thereto,

digital storage means for storing a digitally encoded, manually provided signal indicative of said desired temperature,

comparator means connected to said digital storage means, said pulse counting circuit and to said differential amplifying means for sensing a change in identity of the greatest input to said differential amplifying means to initiate a comparison of said output of said pulse counting circuit and said desired temperature, and connected to supply a regulating signal, and

means responsive to said regulating signal for controlling actuation of said magnetron in response to the level of resistance in said probe.

4,220,841

MICROWAVE GENERATING DEVICE UTILIZING A MAGNETRON

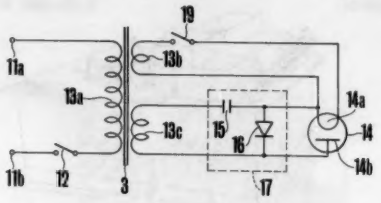
Tomokatsu Oguro, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 718,001, Aug. 26, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,019

Claims priority, application Japan, Nov. 7, 1975, 50-133088

Int. Cl.[3] H05B 6/68

U.S. Cl. 219—10.55 B **7 Claims**



1. In a microwave generating device providing a high frequency power output for production of heat utilizing a magnetron having a directly heated cathode filament, and including a transformer having a secondary winding connected in series with said cathode filament for providing a flow of current to the cathode filament to provide heating power thereto, the improvement which comprises a switching element connected in series with the transformer secondary winding and the cathode filament of the magnetron, and means for causing said switching element to intermittently interrupt the current flowing from the secondary winding through the cathode filament without quickly varying the cathode temperature, the intermittent interruption determining the duty ratio of said current flowing to said filament to be less than continuous current flow thereby decreasing average heating current to said filament and thereby varying the high frequency power output of said microwave generating device.

4,220,842

METHOD OF REMOVING MATERIAL FROM A WORKPIECE

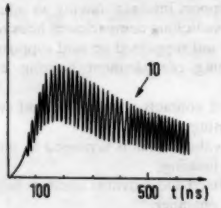
Ekkehard Stürmer, Uetendorf, and Bernhard Einstein, Kehrsatz, both of Switzerland, assignors to Lasag AG, Thun, Switzerland

Filed Oct. 6, 1977, Ser. No. 839,812

Claims priority, application Switzerland, Oct. 7, 1976, 12737/76

Int. Cl.[2] B23K 9/00

U.S. Cl. 219—121 LM **23 Claims**



1. A method of removing material from a metallic workpiece, more especially drilling, by means of a focused laser beam impulse of a pulsed infrared laser, more especially a CO_2-laser, characterized in that the surface of the location, to be processed, of the workpiece is arranged in the beam waist of a focused laser beam impulse or at a spacing (d) in the propagation direction of the laser beam impulse in front of the beam waist and is surrounded with an atmosphere containing helium

and/or hydrogen, and the timewise intensity course of the laser beam impulse is so dimensioned and the laser beam impulse is focused at such a large aperture angle that an expanding plasma, absorbing the laser radiation, is formed at the start of the laser beam impulse in front of the location to be processed, but is maintained only during a fraction of the laser beam impulse.

4,220,843

PROCESS FOR MELTING MATERIAL

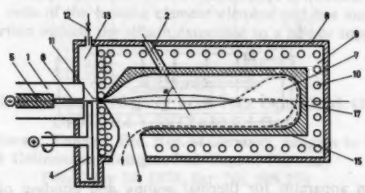
Werner J. Borer, Flurlingen; Volker Nobbe, Neuhausen am Rheinfall, and Hugo Spalinger, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Division of Ser. No. 893,898, Apr. 6, 1978. This application Sep. 27, 1978, Ser. No. 946,415

Claims priority, application Switzerland, Apr. 29, 1977, 5351/77

Int. Cl.³ B23K 9/00

U.S. Cl. 219—121 P **9 Claims**



1. A process for melting material in powder form comprising: providing a horizontally disposed reactor having a reactor floor, a horizontally disposed main axis relative to said floor, a vertically disposed reactor wall relative to said floor extending from said floor, and an exit port in the floor; feeding the material into said reactor downwardly at an angle of at most 90° with respect to the main axis of the reactor; directing a plasma stream into the reactor via an inlet port and on to the material being fed into the reactor at an angle of at most 90° with respect to the feed direction of the material, whereupon the material is melted, is thrown against the reactor wall and flows on the floor of the reactor towards said exit; and tapping the melt from the reactor via the exit port, wherein the outflowing melt is maintained at a sufficiently high temperature to prevent solidification by positioning the exit port adjacent the plasma stream inlet port.

4,220,844

METHOD OF AND DEVICE FOR PLASMA MIG WELDING

Wilhelmus G. Essers, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

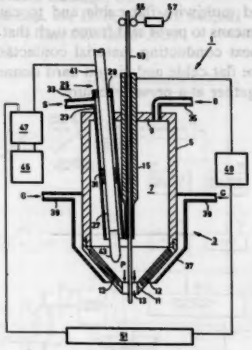
Continuation of Ser. No. 467,385, May 6, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 845,108

Claims priority, application Netherlands, May 23, 1973, 7307170

Int. Cl.² B23K 9/16

U.S. Cl. 219—121 P **2 Claims**

1. A method of plasma-MIG welding, which comprises flowing a first gas stream consisting of a first thermally ionizable inert gas past a primary non-consumable electrode toward an auxiliary non-consumable nozzle electrode, said first gas stream completely enveloping said primary non-consumable electrode; establishing a plasma arc between said primary non-consumable electrode and said auxiliary non-consumable nozzle electrode to initiate and sustain a plasma flow downstream of said primary non-consumable electrode and out through said auxiliary non-consumable nozzle electrode; feeding a consumable electrode from an enclosed source through said plasma flow and out through said auxiliary non-consumable nozzle electrode toward a workpiece, said feeding resulting in an exposed portion of said consumable electrode; establishing a MIG-arc between said consumable electrode and said workpiece; flowing a second gas stream consisting of a mixture of a second thermally ionizable inert gas and an oxidizing gas past said consumable electrode in a manner to completely envelope the exposed portion of and oxidize the same and into admixture with said plasma flow, the resulting plasma flow



thereby containing the oxidizing gas, the first gas stream protecting said primary non-consumable electrode against oxidation by the oxidizing gas; and flowing a third gas stream consisting of a protective gas past the resulting plasma flow after its passage through the auxiliary non-consumable nozzle electrode toward the workpiece to provide a sheath surrounding said resulting plasma flow.

4,220,845

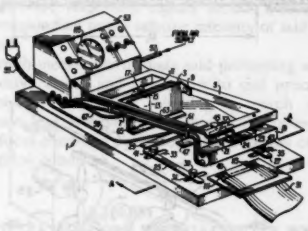
FLAT CABLE SOLDERING APPARATUS

Charles Morreale, Fort Lauderdale, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1978, Ser. No. 947,901

Int. Cl.² H05B 1/00

U.S. Cl. 219—243 **10 Claims**



1. Soldering apparatus for pretinned multiwire flat cable and circuit card connectors, comprising:

a base member;

a support bracket mounted on said base member;

a frame member vertically, pivotally mounted to said bracket;

a frame driving means mounted on said base member and movingly coupled to one end of said frame member;

means for receiving and aligning said circuit card connector and said pretinned multiwire flat cable to provide a plurality of circuit card conductor-to-flat cable conductor joints, said means for receiving and aligning being adjustable and mounted on said base member below said heating means;

means for heating circuit card conductor-to-flat cable conductor joints above the eutectic point of said pretinned

multiwire flat cable, said heating means mounted on said frame member on an end opposite of said frame driving means, said heating means including a heating element and an elongated bar of heat conducting material; and

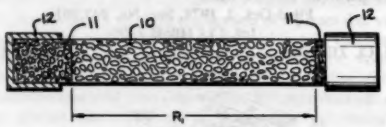
timing and control means for controllably actuating said heating means and said frame driving means to cause said heating means to be heated above the eutectic point of said pretinned multiwire flat cable and to cause said frame driving means to pivot said frame such that said elongated bar of heat conducting material contacts said pretinned multiwire flat cable and circuit card connector to solder them together at a preset pressure.

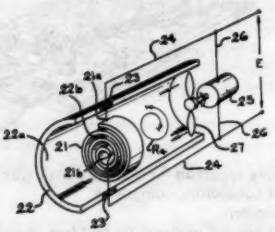
4,220,846

METHOD AND APPARATUS UTILIZING A POROUS VITREOUS CARBON BODY PARTICULARLY FOR FLUID HEATING

Warren A. Rice, Dexter; Clarence S. Vinton, Ann Arbor; Charles H. Franklin, Ann Arbor, and Christopher J. Torbett, Ann Arbor, all of Mich., assignors to The Fluorocarbon Company, Anaheim, Calif.

Filed Jul. 26, 1978, Ser. No. 928,051
Int. Cl.[2] H05B *3/14*; C01B *31/00*
U.S. Cl. 219—381 **16 Claims**





1. An electrical resistance element which comprises:

(a) a body of rigid interconnected multi-directional continuous strands of heat treated vitreous carbon forming a rigid porous three dimensional skeletal structure with current conductive paths between at least two regions of the body; and

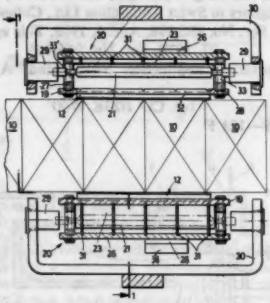
(b) at least two electrical connector means attached to the regions so that an electrical current can be distributed through the body said body having been heat treated to at least about 1800° in a non reactive atmosphere.

4,220,847

APPARATUS FOR THERMAL SEALING THE ENDS OF A STACK OF FOIL WRAPPED PACKAGES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Filed Apr. 29, 1977, Ser. No. 792,367
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623598
Int. Cl.[2] H05B *1/00*; B30B *15/34*; B65B *51/14*
U.S. Cl. 219—388 **3 Claims**



1. An apparatus for thermal sealing and bonding of foil wrapping of cigarette packages comprising:

a conveyor for transporting stacked packages through a heat sealing station, said heat sealing station having heat sealing units arranged on opposite sides of the path of travel of the conveyor of simultaneously heat sealing the ends of a stack of packages,

each heat sealing unit including a plurality of superposed spaced heating strips equal in number to the packages in the stack and arranged so that each strip can be brought into contact with the end of a different one of the packages in the stack,

said heating strips being made of thin, high heat conductivity metal and having a low thermal inerita,

means for mounting said strips in a housing for unitary movement into contact with the ends of said packages, said housing enclosing a plurality of infrared heat radiators, one for each strip, spaced from the side of said strips opposite the side adapted to contact the package ends for heating said strips by radiant heat in a contact free manner,

said housing being mounted for selectively moving said heating strips into and out of contact with the package ends, and

means for independently fixedly mounting said heat radiators relative to said movable heating strips and said housing such that said housing an said heating strips are movable as a unit relative to said fixedly mounted radiators for bringing said strips into and out of contact with the pcakge ends.

4,220,848

WATER BED HEATER

James P. McMullan, and Albert Stevens, both of 2630 Seaman Ave., El Monte, Calif. 91753

Filed Oct. 25, 1978, Ser. No. 954,406
Int. Cl.[2] H05B *3/34*
U.S. Cl. 219—528 **6 Claims**

1. A soft, resilient and flexible blanket-type electric resistance heater comprising a sheath including top and bottom panels of thin, supple, flexible, elastic and impervious plastic material; an elongate, flexible electric resistance element having greater tensile strength than the sheath is loosely arranged

in a slack serpentine pattern between and throughout the plane of the panels with adjacent portions in variable spaced relationship from each other; the panels are sealed together about; the perimeter of the sheath; the panels are fixed together at locations between and spaced from adjacent related portions of the element to maintain adjacent portions of the element in spaced relationship from each other; the air in the space between the

panels is exhausted therefrom to reduce the presence of heat insulating dead air spaces between the panels and to cause the panels to establish substantial uniform heat conducting contact with the element; an elongate power supply cord has one end portion within the sheath and has conductors connected with related ends of the heating element element and has another end portion outside the sheath extending to a power supply.

4,220,849

CIRCUIT ARRANGEMENT FOR THE CONTROL OF A DIGITALLY SETTABLE LOAD

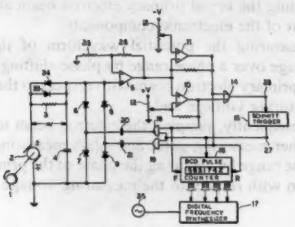
Peter Harzer, Eningen, Fed. Rep. of Germany, assignor to Wandel & Goltermann, Eningen, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 909,270

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723299

Int. Cl.[2] G06M *3/14*

U.S. Cl. 235—92 DE **8 Claims**



1. A circuit arrangement for controlling a digitally settable load, comprising:

a manually rotatable control knob;

a tachometer mechanically coupled with said control knob for producing a driving voltage of variable polarity and magnitude depending upon the direction and speed of rotation;

discriminating means connected to said tachometer for emitting one of two control signals upon detecting a driving voltage of a respective polarity exceeding a corresponding threshold, said discriminating means further including an operational amplifier and a pair of comparators each having a first input connected to the output of said operational amplifier and having a second input connected to a supply of reference potential, said operational amplifier being provided with an input circuit containing a storage capacitor chargeable by said driving voltage;

a reversible pulse counter with a plurality of stage outputs connectable to the load;

pulse-generating means operatively connected between said pulse counter and said discriminating means for respectively translating said two control signals into forward-stepping and reverse-stepping pulses applied to said pulse counter; and

feedback means connected between said pulse-generating means and said storage capacitor for depleting the charge of the latter in response to the generated stepping pulses.

4,220,850

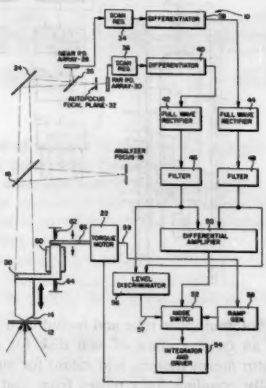
BIMODAL AUTOFOCUSING APPARATUS

Richard D. McEachern, Carrollton, Tex., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Sep. 29, 1978, Ser. No. 946,981

Int. Cl.[3] G01J *1/36*

U.S. Cl. 250—204 **10 Claims**



1. In automatic lens focussing apparatus having an objective lens to be placed at a desired focal plane, a focus sensor located on either side of the focal plane for sensing respective light images, processing means for processing information from said sensors relating to the intensity of said light images, and drive means responsive to said processed information for moving said lens to the desired focal plane in a localized focal condition, the improvement comprising:

each of said focus sensors including,

a photodiode array sensing a light image at respective locations, and scanning means for scanning said photodiode array to provide respective signals to said processing means corresponding to the relative intensity of said light images; and

detection-switch means intermediate said processing means and said drive means and responsive to said processed information for selectively initiating a search mode wherein said lens is moved to scan and reacquire said localized focal condition upon detection of a loss of said localized focal condition.

4,220,851

GAIN STABILIZATION FOR RADIOACTIVITY WELL LOGGING APPARATUS

Houston A. Whatley, Jr., Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,394

Int. Cl.[2] G01D *18/00*

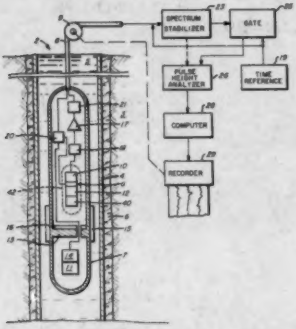
U.S. Cl. 250—252 **10 Claims**

1. In a radioactive well logging apparatus which bombards earth formations and fluid in the vicinity of a well borehole with neutrons from a neutron source and detects resulting gamma radiation in a detector with a scintillation crystal for emitting flashes of light in response to the gamma radiation and a photomultiplier tube which forms voltage pulses in response to flashes of light furnished thereto, both said scintillation crystal and said photomultiplier tube being mounted in a sonde with a space therebetween, a gain stabilization apparatus comprising:

a light emitting diode;

oscillator means for causing said light emitting diode to emit light pulses; and

means for mounting said light emitting diode between said scintillation crystal and said photomultiplier tube, said means for mounting comprising a disk of optically transparent material positioned in said space with an axis thereof extending between said scintillation crystal and



said photomultiplier tube and including a groove formed about an outer surface of said disk for receipt of said oscillator means therein, said means for mounting further optically coupling light pulses from said light emitting diode for gain stabilization and scintillations from said scintillation crystal to said photomultiplier tube for well logging.

4,220,852

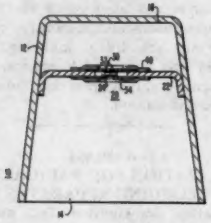
RADIATION DOSIMETER ASSEMBLY

John G. Seidel, McCandless, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 13, 1978, Ser. No. 941,995

Int. Cl.[2] G01V *5/00*; G01T *1/11*; H05B *33/00*

U.S. Cl. 250—253 **4 Claims**



1. In a radiation monitoring apparatus for location beneath the surface of the earth to monitor radiation emanating therefrom, the combination of:

a cup-like housing member; and

a radiation dosimeter means consisting of a support means and a radiation dosimeter secured to said support means, said radiation dosimeter responding to heating by releasing stored radiation energy, said radiation dosimeter means being secured within said cup-like housing member;

the materials of said cup-like housing member and said support member being capable of withstanding a temperature suitable for releasing stored radiation from said radiation dosimeter.

4,220,853

METHOD FOR THE CONTACTLESS MEASUREMENT OF THE POTENTIAL WAVEFORM IN AN ELECTRONIC COMPONENT AND ARRANGEMENT FOR IMPLEMENTING THE METHOD

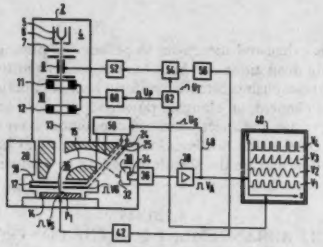
Hans-Peter Feuerbaum, and Eckhard Wolfgang, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,480

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2814049

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—310 **7 Claims**



1. A method for the contactless measurement of the potential waveform resulting from application of a measuring voltage in an electronic component with a keyed primary electron beam which releases secondary electrons at the measuring point, the energy of which is determined by the potential at the measuring point, comprising:

(a) aiming the keyed primary electron beam at a measuring point of the electronic component;

(b) measuring the potential waveform of the measuring voltage over a phase range by phase-shifting the pulses of the primary electron beam with respect to the phase of the measuring voltage; and

(c) subsequently, jumping the electron beam to at least one further measuring point and again measuring values of a phase range by changing the phase of the primary electron beam with respect to the measuring voltage.

4,220,854

METHOD FOR THE CONTACTLESS MEASUREMENT OF THE POTENTIAL WAVEFORM IN AN ELECTRONIC COMPONENT AND APPARATUS FOR IMPLEMENTING THE METHOD

Hans-Peter Feuerbaum, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 21, 1979, Ser. No. 22,484

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813947

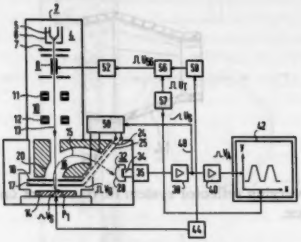
Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—310 **4 Claims**

1. A method for measuring the potential waveform in an electronic component resulting from application of a measuring voltage thereto with a keyed primary electron beam which releases secondary electrons at the measuring point, the energy of which is determined by the potential at the measuring point, comprising:

(a) generating a multiplicity of pulses of the primary electron beam which contains alternatingly a pulse sequence with a fixed reference phase with respect to the potential waveform of the measuring voltage and a pulse sequence with

a measuring phase which is shifted with respect to the reference phase; and



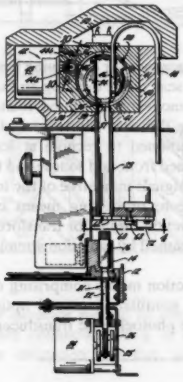
(b) measuring the potential difference between the reference phase and the measuring phase.

4,220,855

SCINTILLATION COUNTER WITH ROTATABLE LIGHT SEAL

James F. Johnson, LaGrange Park, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Sep. 28, 1978, Ser. No. 946,801
Int. Cl.² G01T 1/00
U.S. Cl. 250—328 **6 Claims**



1. In a scintillation counter having a counting chamber formed by a housing having an internal cylindrical cavity and an opening for admitting a sample vial, an improved light seal comprising

a ring shutter mounted in the internal cylindrical cavity for rotation from an open position to a closed position, said ring shutter having

(i) an aperture for alignment with the opening in the housing in said open position and thereby allowing the sample vial admission to the internal cylindrical cavity and

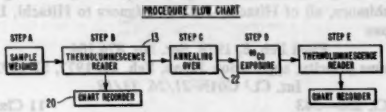
(ii) a shroud portion adjacent the aperture for covering the opening in the housing when the ring shutter is rotated to said closed position.

4,220,856

METHOD OF ANALYSIS OF ASBESTIFORM MINERALS BY THERMOLUMINESCENCE

Gerald L. Fisher, and Edward W. Bradley, both of Davis, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,617
Int. Cl.² G01T 1/11; H05B 33/00
U.S. Cl. 250—337 **11 Claims**



1. A method of analysis of an untreated sample for asbestiform minerals, comprising the steps of:

heating the untreated sample during a first time period;

detecting the amount of thermoluminescence of the sample during heating as a function of sample temperature during the first time period;

annealing the sample following said detection step to exhaust all thermoluminescence of the sample;

subjecting the sample to ionizing radiation following said annealing;

heating the sample during a second time period following said ionizing radiation of the sample; and

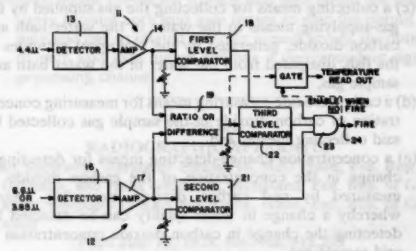
detecting the amount of thermoluminescence of the sample as a function of sample temperature during heating during the second time period.

4,220,857

OPTICAL FLAME AND EXPLOSION DETECTION SYSTEM AND METHOD

Clark I. Bright, Walnut Creek, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed Nov. 1, 1978, Ser. No. 956,641
Int. Cl.² G01J 1/00
U.S. Cl. 250—339 **38 Claims**



1. In an optical detection system, first channel means responsive to radiation associated with a molecule, free radical or other combustion product whereby detected radiation is converted into a first electrical signal, second channel means responsive to radiation associated with a molecule, free radical or other combustion product which has a wavelength which differs from that of the wavelength of the combustion product sensed by the first channel whereby detected radiation is converted into a second electrical signal, first and second level comparators for ascertaining when the first and second electrical signals produced by the first and second channels rise above predetermined values, means for comparing the first and second electrical signals and ascertaining when they are substantially different from that given by a continuum radiation source and providing a third electrical signal and means for combining the outputs from the first and second level compar-

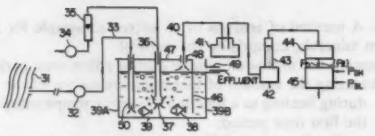
ators and the third electrical signal and supplying an output signal when signals are supplied by the first and second level comparators and a signal is supplied by the means for comparing the first and second signals.

4,220,858

APPARATUS FOR DETECTING CHANGE IN WATER QUALITY

Takashi Ikeguchi; Shunsuke Nogita; Kouji Otani, and Shigeoki Nishimura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 8, 1978, Ser. No. 876,104
Claims priority, application Japan, Feb. 10, 1977, 52-13921
Int. Cl.[2] G01N *21/26, 33/18*
U.S. Cl. 250—343 **11 Claims**



1. An apparatus for detecting a change in water quality by using biological activities of fish, which comprises:

(a) a water bath to which sample water is introduced, said water bath having fish living therein, the water bath comprising a chamber tightly sealed to the atmosphere and a chamber open to the atmosphere, the two chambers being partitioned by partition means having a lower end at a clearance from a bottom surface of the water bath and preventing said fish from entering the chamber open to the atmosphere, and an effluent passage provided at the chamber open to the atmosphere, the fish generating carbon dioxide during their biological activities, whereby the carbon dioxide generated by said fish changes depending on the water quality of the sample water introduced in said water bath,

(b) a gas-supplying means for supplying a gas having no adverse effect upon the biological activities of the fish to water in said water bath, and for stirring the water,

(c) a collecting means for collecting the gas supplied by the gas-supplying means to the water in the water bath and carbon dioxide, generated by the biological activities of the fish, dissipated from the water in the water bath as a sample gas,

(d) a carbon dioxide-measuring means for measuring concentration of carbon dioxide in the sample gas collected by said collecting means, and

(e) a concentration change-detecting means for detecting a change in the concentration of the carbon dioxide as measured by said carbon dioxide measuring means, whereby a change in water quality can be detected by detecting the change in carbon dioxide concentration in said sample gas.

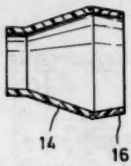
4,220,859

INFRA RED RADIATION DETECTOR

John P. C. Vigurs, East Molesey, England, assignor to IM Electronics Limited, England

Filed Sep. 5, 1978, Ser. No. 939,845
Claims priority, application United Kingdom, Mar. 23, 1978, 11854/78
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—353 **1 Claim**

1. A detector for detecting electromagnetic radiation within the infra red region of the electromagnetic spectrum comprising a pryo-electric transducer positioned so as to intercept electromagnetic radiation focussed by a converging reflector system wherein said converging reflector system is at least partially frusto-conical including an extension added to said converging reflector system, said extension being divergent towards said pyro-electric device and positioned at the end of



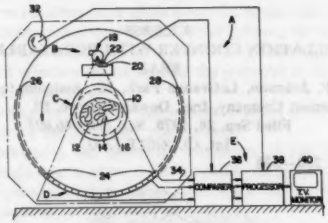
said converging reflector system furthest from said pyro-electric device.

4,220,860

TOMOGRAPHIC SCANNER WITH CADMIUM TUNGSTATE SCINTILLATION CRYSTALS

Roland W. Carlson, Lyndhurst, and Carl T. Jagatich, Chagrin Falls, both of Ohio, assignors to Ohio Nuclear, Inc., Solon, Ohio

Filed Jul. 24, 1978, Ser. No. 927,602
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—361 R **21 Claims**



1. A tomographic scanner for examining a planar region of a patient comprising a scan circle defining an examined region; a source of radiation moveably mounted relative to said scan circle for subjecting the scan circle to radiation; radiation detection means positioned to receive at least some of the radiation that has passed from said source and through the scan circle for producing signals indicative of the intensity of radiation impinging thereon; processing means operatively connected with said detection means for transforming said signals into a visual display caused by radiation attenuation in the scan circle;

said radiation detection means comprising at least one cadmium tungstate scintillation crystal optically connected with at least one photoelectric transducer.

4,220,861

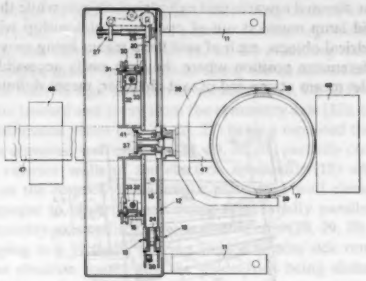
GAMMA CAMERA TOMOGRAPHY APPARATUS

Sergio Colombo, and Luigi Terra, both of Milan, Italy, assignors to SELO Societa Electtronica Lombarda S.p.A., Milan, Italy

Filed Apr. 20, 1978, Ser. No. 898,038
Claims priority, application Italy, Jun. 15, 1977, 24713 A/77
Int. Cl.[2] G01T *1/20;* G12B *9/00*
U.S. Cl. 250—363 S **10 Claims**

1. An apparatus for making tomographic or normal surveys by means of a gamma camera, comprising a base frame, a discoidal member supported at its periphery vertically on said base and for rotation coaxially about its axis, an articulated support for a survey head containing a gamma camera means mounting said support on said member for movement thereon

radially of said axis, the discoidal member having therein a central hole through which the body of a patient supported on



a sliding bed can pass, and motor means for rotating the discoidal member and for radially moving the head support thereon.

4,220,862

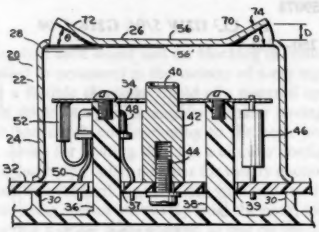
IONIZATION CHAMBER FOR A SMOKE DETECTOR HAVING AN IMPROVED ARRANGEMENT FOR CAPTURING AIRBORNE COMBUSTION PRODUCTS

Michael Byrne, Farronshone, Ireland, assignor to General Electric Company, New York, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,380

Int. Cl.² G01T *1/18*

U.S. Cl. 250—384 **10 Claims**



1. In a smoke detector having an ionization chamber, improved means for enhancing entry of airborne combustion products to the ionization chamber, said improved means comprising:

housing means forming passage means for permitting the flow of air currents from a plurality of different directions through said smoke detector without substantial restriction of the air currents,

said housing means including a housing member having a wall portion thereof having a first outer surface exposed to air currents flowing through said passage means and a second inner surface at least partially defining said ionization chamber,

an aperture means formed in said wall portion, and

an inlet surface means extending outwardly from said wall portion into said passage means for conveying air from said passage means through said aperture means into said ionization chamber.

4,220,863

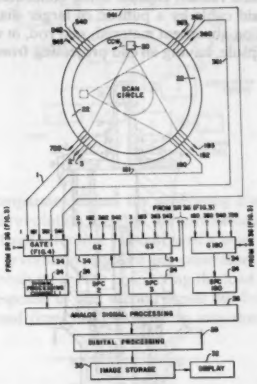
DATA CHANNEL MULTIPLEXING SYSTEM FOR CT SCANNER WITH ROTATING SOURCE

Thomas R. McBride, Chardon; Robert H. Wake, Warrensville Heights, and Robert H. McCarthy, Willowick, all of Ohio, assignors to Ohio Nuclear, Inc., Solon, Ohio

Filed Apr. 1, 1977, Ser. No. 783,732

Int. Cl.² G03B *41/16*

U.S. Cl. 250—445 T **5 Claims**



1. In a CT scanner having a series of stationary radiation detectors spaced in a curved path about a center point and a concentrically rotating fan pattern of radiation subtending a number of the detectors, the irradiated area common to different positions of the fan pattern defining a corresponding patient scan circle, a data channel multiplexing system comprising:

a number of gate means corresponding to the maximum number of detectors subtended by the fan pattern, each connected to receive the outputs of a respective exclusive group of non-consecutive detectors, one and only one of which is irradiated at any given time by the radiation fan,

control means connected to each said gate means for selectively causing each said gate means to pass the output of only said one irradiated detector in each group, the output of each said gate means defining a corresponding signal processing channel.

4,220,864

RADIOGRAPHIC APPARATUS

Kurt Sauerwein, Bergische Strasse 16, 5657 Haan, Fed. Rep. of Germany, and Hans Goedecke, Mettmann, Fed. Rep. of Germany, assignors to Kurt Sauerwein, Haan, Fed. Rep. of Germany

Filed Jun. 13, 1978, Ser. No. 915,203

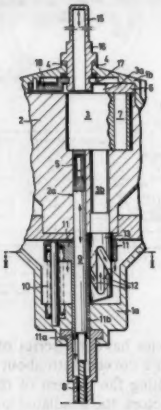
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727359

Int. Cl.² G21F *5/02*

U.S. Cl. 250—497 **5 Claims**

1. In radiographic apparatus having a housing, means defining an outlet opening therefrom, a tubular guide adapted to lead from said outlet opening, a protective body of gamma-radiation-absorbent material enclosed within said housing, a breech body forming part of said protective body and defining a guide channel, means mounting said breech body for movement transversely of the guide channel to bring said guide channel into an aligned position with said outlet opening and a non-aligned position therewith, a flexible cable movable through said protective body from the side of said housing opposite to said outlet opening by means of a driving mechanism arranged remote from said apparatus, and a radiant capsule connected to one end of said cable and adapted to be run

out from a position of rest inside said protective body through said guide channel when in said aligned position and hence through said outlet opening and into said tubular guide; the improvement wherein said breech body is coupled to the end of said cable carrying said radiant capsule in such a way that by hauling back said end of said cable beyond said rest position of said radiant capsule said breech body is moved alternately between said aligned and non-aligned positions, said breech body being rotatable about an axis parallel with said guide channel; and said radiant capsule being connected to the adjacent end of said cable by a pullrod of larger diameter and of gamma-radiation-absorbent material; said rod, in said rest position of said capsule, having an end projecting from said protective body and engaging an abutment in an operating body which is guided in said housing so as to be movable axially against the force of a spring but unable to rotate and which holds in a bore a control cylinder fastened on to the free end of an axial journal on said breech body; a driving pin, loaded by a spring, being movable radially with respect to the axis of said journal and engaging in one of two part helical grooves cut in said control cylinder and respectively running 180° around said control cylinder and the ends of which nearer to said breech body are such connected to the respective opposite end of the other of said grooves by a straight groove parallel with said axis and having a root which towards its end adjacent to said breech body rises up to the root of said adjoining helical groove.



4,220,865

ULTRAVIOLET CURING OVEN WITH ROTABLE LAMP ASSEMBLY

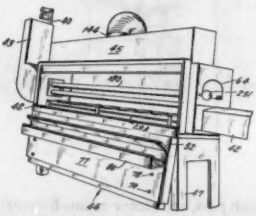
Stanley Silverman, Denville, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Filed Nov. 24, 1978, Ser. No. 963,370

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—504 R **12 Claims**

1. An ultraviolet curing oven for curing decorations on a cylindrical object; said oven comprising an elongated chamber having openings in its opposite ends for receiving a continuously moving pin chain having cylindrical objects thereon which have ultraviolet curable fluid on their outer surfaces; object rotating means for continuously rotating said cylindrical objects while they move along the length of said oven; first and second elongated lamp means and first and second coextensive reflector means therefor disposed within said oven and extending along the length of said oven; rotatable mounting means coextensive with and receiving said first and second lamp means and their respective reflector means and rotatable about an axis which is parallel to the axes of said first and second lamp means and which is disposed between the spaced axes of said first and second lamp means; said rotatable mounting means operable for alternately positioning only one of said lamp means in operative relationship with respect to said cylindrical objects with the radiation of only said one of said lamp means directed towards said cylindrical objects while the other of said lamp means is out of operative relationship with said cylindrical objects; each of said lamp means being movable to a maintenance position where they are easily accessible; first air inlet means at one end of said chamber; means defining first and second conduits operatively secured to said rotatable mounting means and extending longitudinally of said first and second reflector means, respectively; said conduits having opening means for directing said air to cool said reflector means; said rotatable mounting means also operable for alternately positioning only one of said conduits in operative position with said first air inlet means for cooling the reflector means of said lamp means that is in operative relationship with said cylindrical objects.



4,220,866

ELECTRON APPLICATOR

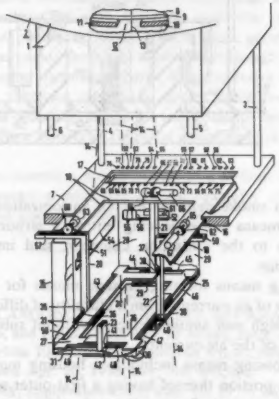
Leonhard Taumann, and Edgar B. Symmons, both of Walnut Creek, Calif., assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 21, 1978, Ser. No. 871,200

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759073

Int. Cl.[2] G21F *5/04*; G21K *1/04*

U.S. Cl. 250—513 **12 Claims**



1. An electron irradiator comprising an electron source, primary electron field shaping means and an electron applicator at the point of radiation egress in the radiation direction after the primary field shaping means of the electron source, said adjustable collimator plates surrounding and disposed in planes oriented perpendicularly to the symmetry axis of the electron applicator, characterized in that the collimator plates

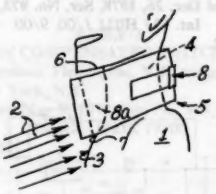
(24, 25, 26, 27) each have transverse legs which overlap the legs of other plates, said collimator plates each having fixedly connected guide rods extending parallel to the respective legs, and the length of each of the guide rods being such as to not extend beyond the ends of a respective parallel leg movable therewith, and carrier means (20, 21, 22, 23) mounting each of said collimator plates for movement along the directions of the lengths of both its legs, said carrier means (20, 21, 22, 23) being adjustable toward and away from the symmetry axis (13), each of the collimator plates (24, 25, 26, 27) having mounted therewith one cornered wall element (28, 29, 30, 31) partially covering the exterior walls of the electron applicator (15) which border on the respective collimator plate, said wall elements being opaque to electrons and being substantially parallel to said symmetry axis and adjacent wall elements (28, 29, 30, 31) overlapping in a virtually grazing fashion on the side remote from the electron source (2), the guide rods being slideably attached to and guided by respective carrier means during adjustment of the carrier means without projection of the guide rods outside of the wall elements.

4,220,867

NECK X-RAY PROTECTIVE SHIELD

Winston N. Bloch, Jr., 4525 North Frederick Ave., Milwaukee, Wis. 53211

Filed Jul. 18, 1978, Ser. No. 925,804
Int. Cl.³ G21F *3/02*
U.S. Cl. 250—516 **2 Claims**



1. A protective neck shield unit for blocking of frontal chest X-rays applied to personnel in the vicinity of x-ray equipment comprising a flexible sheet-like shield of a material opaque to X-rays, said shield being a rectangular member having a constant width and depth corresponding to the neck portion of personnel, means for holding shield in a circular configuration to define an encircling collar member for totally encompassing the front and side areas of the neck and with said front portion of the collar being spaced outwardly from the neck, said collar member having a lower edge adapted to rest on the chest and shoulder of the patient to support the collar member and extending upwardly therefrom to totally encompass the front and sides of the neck whereby the body portion in the total neck area susceptible to damage from chest X-rays are totally protected.

4,220,868

METHOD OF AND SYSTEM FOR CONTROLLABLY CONNECTING LOAD TO GENERATOR

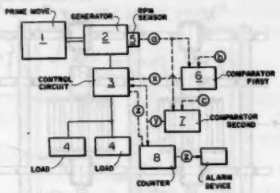
Tohru Takeuchi, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 21, 1978, Ser. No. 880,226
Claims priority, application Japan, May 27, 1977, 52/67701[U]
Int. Cl.² H02P *9/04*
U.S. Cl. 290—7 **5 Claims**

1. A control system for a generator system having a prime mover, a generator driven by the prime mover and a load adapted to be connected to the generator, said control system comprising:

a detector means for detecting the revolution speed of the generator;

a first comparator means for generating a first signal when said revolution speed of the generator is lower than a first fixed reference indicative of a level higher than a level in revolution speed of the generator when the prime mover is idling;



a second comparator means for generating a second signal when said revolution speed of the generator is higher than a second fixed reference indicative of a level approaching the rated revolution speed of the generator; and

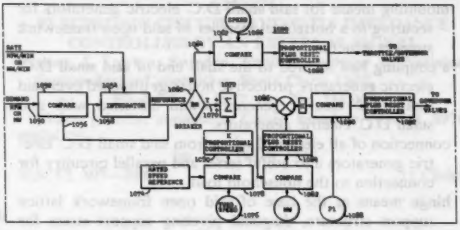
a control circuit means for connecting the load to the generator in response to said second signal but for disconnecting the load from the generator in response to said first signal.

4,220,869

DIGITAL COMPUTER SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH EFFICIENT CONTROL MODE SELECTION

Robert Uram, East Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 247,849, Apr. 26, 1972, abandoned. This application Mar. 8, 1974, Ser. No. 449,562
Int. Cl.² H02P *9/04*
U.S. Cl. 290—40 R **12 Claims**



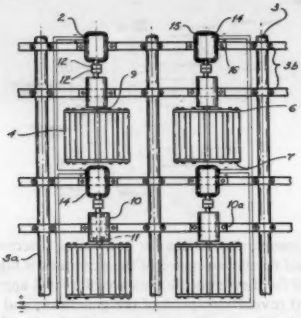
1. An automatic digital electrohydraulic control system for a steam turbine having a plurality of throttle and governor valves, said control system comprising means for generating respective signals representative of the actual turbine speed and load, an operator panel having means for generating mode select signals and load and speed demand signals, an electrohydraulic control for positioning the throttle and governor valves in response to valve position signals, means for digitally generating the valve position signals in response to the actual and demand speed and load signals and the mode select signals during the speed and load modes of turbine operation, a manual backup control for generating valve position signals to operate the valves for speed and load control when said digital generating means is nonoperational, said mode select generating means including means for generating an automatic operation signal, means for tracking the valve position outputs from said digital generating means to the valve position signals generated during the manual mode of operation, and means for disabling a signaled transfer to automatic operation if predetermined conditions are sensed which indicate defective tracking operation by said digital means.

4,220,870

WIND CONVERSION LATTICE ARRAY, WITH MULTIPLE MINI-TURBO-GENERATOR MODULES

Donald A. Kelly, 58-06 69th Pl., Maspeth, N.Y. 11378

Filed Jun. 22, 1978, Ser. No. 918,062
Int. Cl.[3] F03D 9/00; H02P 9/04
U.S. Cl. 290—44 6 Claims



1. An array of identical miniature wind turbine/generator modules, the combination comprising an open framework lattice support structure, a plurality of miniature vaned turbine impellers directly coupled to corresponding small D.C. electric generators, said miniature vaned turbine impellers comprised of a plurality of concave linear vanes vertically disposed and secured to an upper and lower disc adjacent to the outer periphery of said discs, a centrally disposed shaft fixed to each of said discs protruding from an end of one of said discs,

a coupling half secured to the protruding end of said shaft, a bearing housing containing two miniature ball bearings fitted over said shaft, said bearing housing fastened to a horizontal member of said open framework lattice support structure,

mounting means for said small D.C. electric generators for securing to a horizontal member of said open framework support structure,

a coupling half secured to the shaft end of said small D.C. electric generators, protective housings disposed over said small D.C. electric generators and mounted with said small D.C. electric generators,

connection of all electrical wires from said small D.C. electric generators into useful series and parallel circuitry for connection to the household load,

hinge means at the base of said open framework lattice support structure, diagonal pivoting support struts for maintaining said open framework lattice support structure in an upright position.

4,220,871

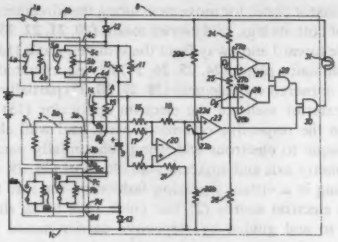
ELECTRIC CONTROL CIRCUIT FOR SAFETY APPARATUS IN AUTOMOTIVE VEHICLES

Toshio Yasui, Obu; Motoharu Naito, Okazaki, and Ken Asami, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 7, 1978, Ser. No. 940,446
Claims priority, application Japan, Sep. 8, 1977, 52-108311
Int. Cl.[2] B60K 28/00
U.S. Cl. 307—10 R 6 Claims

1. In an electric control circuit for a safety apparatus of an automotive vehicle, which control circuit comprises an electric power source, normally open switch means to be closed in an occurrence of vehicle collision, and first and second electrically operated actuator means connected respectively in seies with said power source through said switch means to actuate said safety apparatus upon closure of said switch means, the improvement comprising:

first and second resistors connected respectively in series with said first and second actuator means, each resistance value of said first and second resistors being predetermined with respect to internal resistances of the respective actuator means in such a manner that even when one of said actuator means is shorted, a sufficient electric current is supplied to the other actuator means from said power source to actuate said other actuator means.

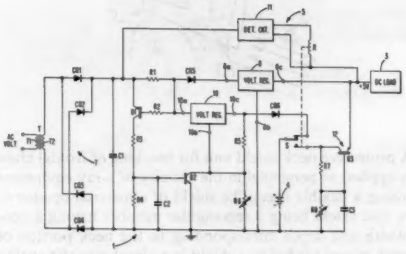


4,220,872

DC POWER SUPPLY CIRCUIT

Robert J. Fahey, Burlington, Mass., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 26, 1978, Ser. No. 973,201
Int. Cl.[2] H02J 1/00, 9/00
U.S. Cl. 307—32 10 Claims



1. A dc power supply circuit for supplying simultaneously dc voltages to a dc load and to a storage device, said dc load and storage device being operative to draw varying amounts of current within corresponding ranges of current and having a predetermined maximum permissible value of current which may be drawn jointly thereby at any given instant, said dc power supply circuit comprising:

dc source means operative to provide a dc voltage;

first circuit means coupled to the dc source means and to the dc load, said first circuit means being operative in response to a dc voltage provided by the dc source means to supply a dc voltage of a predetermined fixed value to the dc load for enabling the dc load to draw current and, as the current drawn by the dc load varies within its associated range of values, to maintain the dc voltage supplied to the dc load at the predetermined fixed value;

second circuit means coupled to the dc source means and to the storage device and operative in response to the aforesaid dc voltage provided by the dc source means to supply a dc voltage to the storage device for enabling the storage device to draw current;

current sensing means in circuit with the first and second circuit means and the dc load and storage device and operative to sense the current drawn jointly by the dc load

and the storage device and to produce a signal indicative thereof; and

control circuit means coupled to the current sensing means and to the second circuit means, said control circuit means being operative in response to the signal produced by the current sensing means as current is sensed by the current sensing means to cause the second circuit means to supply a dc voltage to the storage device, said dc voltage having a value at any given instant for enabling the storage device to draw current of a value equal to the difference between the then existing value of current drawn by the dc load and the predetermined maximum permissible value of current which may be drawn jointly by the dc load and the storage device, whereby as the value of current drawn by the dc load and the storage device varies and is sensed by the current sensing means the value of the dc voltage supplied by the second circuit means to the storage device and the current drawn by the storage device also vary in accordance with the variation in current sensed by the current sensing means.

4,220,873

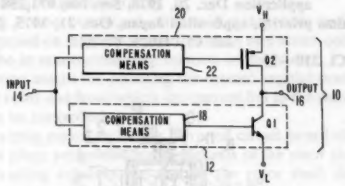
TEMPERATURE COMPENSATED SWITCHING CIRCUIT

Raymond L. Giordano, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1978, Ser. No. 904,450

Int. Cl.² H03K *17/00*

U.S. Cl. 307—254 **10 Claims**



1. In a switching circuit of the type wherein a voltage source is applied to the output terminal thereof through a first bipolar transistor and a signal at the input terminal thereof controls the conductivity of said first bipolar transistor,

the improvement comprising:

compensation means for varying the flow of base current into said first bipolar transistor to hold the saturation voltage thereof substantially constant as temperature changes, including

a Schottky transistor having its base connected to receive the control signal and having its main conduction path connected between said voltage source and a voltage reference through a resistor, the base of said first bipolar transistor being connected to the interconnection between said resistor and the main conduction path of said Schottky transistor, said resistor and the saturation voltage of said first bipolar transistor both having positive temperature coefficients so that the base current of said first bipolar transistor varies inversely with temperature to result in substantially constant saturation voltage thereacross as temperature changes.

4,220,874

HIGH FREQUENCY SEMICONDUCTOR DEVICES

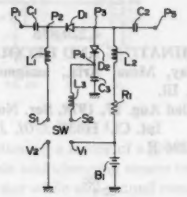
Yutaka Iwata; Seiichi Takahashi, and Katsuzo Kaminishi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,158

Claims priority, application Japan, Feb. 15, 1977, 52-14598; Oct. 24, 1977, 52-126754

Int. Cl.² H03K *17/58*

U.S. Cl. 307—256 **8 Claims**



1. A high frequency semiconductor device comprising (a) a first capacitor connected between first and second connecting points, (b) a first diode connected between second and third connecting points, (c) a second diode connected between third and fourth connecting points, (d) a second capacitor connected between third and fifth connecting points, (e) a third capacitor connected between said fourth connecting point and a high frequency grounding point, (f) first circuit means including a resistance element and connected between said third connecting point and a first potential point, (g) second circuit means connected between said second connecting point and a first switching point, (h) third circuit means for connecting said fourth connecting point and a second switching point, and (i) switching means for transfer connecting one of said first and second switching points to said first potential point and the other switching point to a second potential point.

4,220,875

ELECTRONIC CIRCUIT HAVING ITS IMPEDANCE CONTROLLED BY AN EXTERNAL SIGNAL

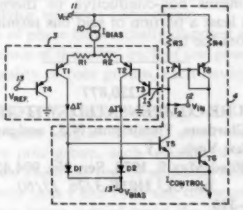
Rodney J. Lawton, Swindon, England, assignor to Natioinal Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 22, 1977, Ser. No. 774,003

Claims priority, application United Kingdom, Mar. 4, 1976, 08644/76

Int. Cl.² H03K *1/14*

U.S. Cl. 307—264 **11 Claims**



1. A device having a controllable impedance, comprising

an input terminal for the device;

a high impedance first stage having an output and an input, wherein the input of the first stage is connected to the input terminal for the device, and the first stage is adapted for providing an output signal at its output in response to an input voltage signal received at its input;

a variable impedance second stage having an output and an input, wherein the input of the second stage is coupled to the output of the first stage, and the second stage is

adapted for providing a current signal at its output in response to the output signal provided at the output of the first stage;

a feedback loop connecting the output of the second stage to the input of the first stage, whereby the device has an input impedance at its input terminal that is proportional to the impedance of the second stage; and

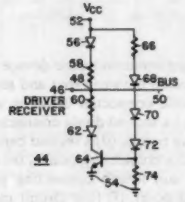
control means coupled to the second stage for controlling the impedance of the second stage in response to an external signal.

4,220,876

BUS TERMINATING AND DECOUPLING CIRCUIT

Kenneth I. Ray, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 17, 1978, Ser. No. 934,447
Int. Cl.³ H03K *3/01, 3/26*
U.S. Cl. 307—296 R **11 Claims**



1. A bus terminating circuit which is self-decoupling from a bus in response to the magnitude of a power supply voltage across a pair of power supply terminals decreasing below a predetermined threshold level, including in combination:

bus termination network means having one terminal coupled to one of the pair of power supply terminals, another terminal coupled to the bus and a further terminal;

electron control means having a pair of main electrodes and a control electrode, one of said main electrodes being coupled to said bus termination network, the other of said main electrodes being coupled to the other of said pair of power supply terminals; and

first threshold sensing means coupled between one of the pair of power supply terminals and said control electrode of said electron control means, said first threshold sensing means including a plurality of semiconductor junctions, said first threshold sensing means being responsive to the magnitude of the power supply voltage falling below the predetermined threshold level to render said electron control means non-conductive to thereby electrically isolate at least a portion of said bus termination network means from the bus.

4,220,877

TEMPERATURE COMPENSATED SWITCHING CIRCUIT

Raymond L. Giordano, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 9, 1978, Ser. No. 904,439
Int. Cl.² H03K *3/26, 17/60*
U.S. Cl. 307—310 **11 Claims**

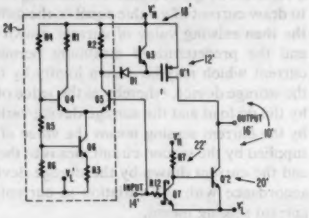
1. A switching circuit of the type wherein a voltage source is applied through a MOS/FET transistor to the output terminal thereof, a signal at the input terminal thereof controls the conductivity of said MOS/FET transistor, and compensation means is provided for varying the gate-source voltage of said MOS/FET transistor to hold the drain-source channel resistance thereof substantially constant as temperature changes, which compensation means comprises:

a bipolar transistor having base, emitter and collector electrodes, and having a base-emitter junction;

means for conditioning said bipolar transistor for supplying a current from its collector electrode that increases with temperature owing to the negative temperature coefficient of the base-emitter junction of said bipolar transistor, including

a resistor with a first end to which the emitter electrode of said bipolar transistor connects and with a second end, and includiing

means for applying a voltage between the base electrode of said bipolar transistor and the second end of said resistor;



means responsive to a positive temperature coefficient current for applying a voltage between the source and gate electrodes of said MOS/FET transistor and exhibiting a temperature coefficient to hold the drain-source channel resistance thereof substantially constant; and

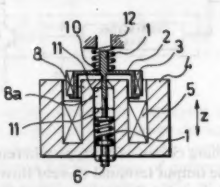
means for applying at least at selected times the collector electrode current of said bipolar transistor as said positive temperature coefficient current.

4,220,878

DRIVE-FRAME SUPPORT MECHANISM FOR FORCE MOTOR

Masuyuki Asano, Nishikasugai, and Shojiro Omuro, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 737,339, Nov. 1, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,258
Claims priority, application Japan, Oct. 31, 1975, 50-148710
Int. Cl.² H02K *41/02*
U.S. Cl. 310—13 **3 Claims**



1. A force motor construction, comprising, a magnetic pole piece having a central portion with an opening therethrough defining a drive frame support journal and a spring cavity defined below the opening and having an angular coil cavity surrounding said central portion, an excitation coil in said coil cavity, a drive frame having a central pin part with a lower pin portion extending through the opening and an upper pin portion opposite to the lower pin portion, a first coil spring engaged on said upper pin portion, a second coil spring engaged on said lower pin portion, a first support holding said first coil spring downwardly against said drive frame, the second support holding said second coil spring upwardly against said frame and a pair of small spring constant springs in the cavity between said first and second support springs and having first and second opposite curved portions and an oblique central portion interconnecting said curved portions, each of said small spring constant springs being connected by their periph-

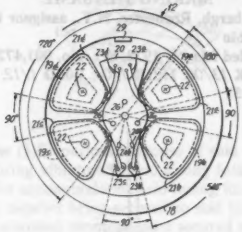
ery to said pole piece central portion and by its center to said central pin part and supporting said drive frame against circumferential and radial movement.

4,220,879

BRUSHLESS DC MOTOR

Susumu Hoshimi, and Kenzo Nakagawa, both of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 9, 1978, Ser. No. 868,048
Claims priority, application Japan, Jan. 10, 1977, 52/130877
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 R **7 Claims**



1. A brushless D.C. motor comprising:

a rotor including a rotor shaft, a rotor yoke mounted on said rotor shaft, and a rotor magnet mounted on said rotor yoke and having n poles, n being an even positive integer;

a stator including a stator yoke and m stator coils disposed on said stator yoke so as to face said magnet in a non-overlapping predetermined angular relationship to each other about the axis of said rotor shaft, m being a positive integer, said rotor yoke and said stator yoke being closely adjacent to each other at their edges to define a relatively flat housing which contains said rotor magnet and which forms a magnetic circuit;

wiring means connected with said stator coils and being disposed on said stator yoke between said stator coils so as to be in non-overlapping relation to the latter;

detecting means for detecting the rotated angular position of the rotor and from which the current fed to the stator coils can be controlled;

said wiring means including a printed circuit board disposed in a plane perpendicular to said axis of the rotor shaft and extending adjacent the end of the rotor shaft disposed nearest to said stator yoke; an

said printed circuit board having a portion abutting said end of the rotor shaft disposed next to the stator yoke and serving as a thrust pad for said shaft relative to the stator.

4,220,880

ADJUSTABLE MOTOR COVER

Randle C. Woodard, 20751 Prairie St., Chatsworth, Calif. 91311

Filed Oct. 2, 1978, Ser. No. 947,730
Int. Cl.[2] H02K *5/00*
U.S. Cl. 310—91 **26 Claims**

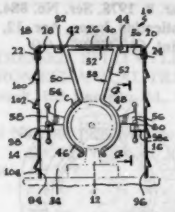
1. A protective cover for an outdoor electric motor, said cover comprising:

a housing having a top interconnected with spaced apart side walls, said housing having a main axis longitudinally centrally disposed;

clamping means detachably secured to said top in suspended relation therewith, said clamping means defining a clamping area arrangement, said clamping means adapted to engage a motor located between said side walls, said clamping means comprises a pair of clamps with a single said clamp being located adjacent each said side wall, said clamps comprise a pair of clamping arms with each of said arms defining a concavity;

first means connected to said housing for adjusting the position of a motor relative to said housing;

second means for adjusting said clamping area arrangement,



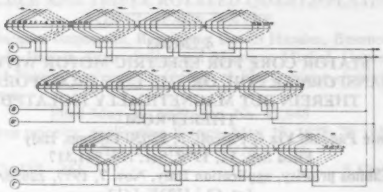
whereby in positioning a motor of a given length, the said first means enable said clamping means to conform to the length of the motor while said second means is to conform with the transverse dimension of the motor.

4,220,881

DUAL, THREE PHASE, INVERTER-DRIVEN MOTOR

David C. Hamilton, Ridgewood, and Joseph W. Fleming, Ramsey, both of N.J., assignors to Ramsey Controls, Inc., Mahwah, N.J.

Filed Apr. 28, 1978, Ser. No. 900,824
Int. Cl.[3] H02K *3/00*
U.S. Cl. 310—184 **8 Claims**



1. A stator assembly for use in a dual, single phase motor system, said stator assembly comprising:

(a) a matrix of phase belts radially disposed at a fixed radius about the axis of the rotor, each of said phase belt comprising a plurality of pole groups, each having twelve stator slots;

(b) a plurality of first motor windings, said motor windings having a span lengths of eight stator slots within each respective pole group, each winding of each pole group having two coils, the first of said coils being wound upon given stator slots i and i+8, and the second coil of each pole group being wound upon the i+1 and i+9 stator slots; and

(c) a plurality of second motor windings, each of said second windings also having a span length of eight stator slots, each winding of said second plurality also having two coils per pole group, the first of said coils being wound upon the i+2 and i+10 stator slots, and the second coil of each pole group being wound upon the i+3 and i+11 stator slots, said windings being symmetrically disposed about the opposite ends of each pole group, thereby leaving the central four slots of each group free of any windings, wherein a 0.67 pole pitch is thereby obtained.

4,220,882

DIRECT CURRENT MOTOR

Yoshinori Kohzai, Hino, and Shigeaki Oyama, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Mar. 8, 1978, Ser. No. 884,586
Claims priority, application Japan, Apr. 12, 1977, 52/40953
Int. Cl.[2] H02K *1/10*
U.S. Cl. 310—186 **6 Claims**

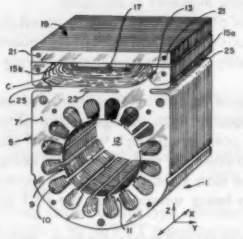
1. A direct current motor comprising a yoke, a plurality of main magnetic poles disposed in a predetermined direction on said yoke with a predetermined pitch between adjacent main magnetic poles, wherein the polarities of adjacent poles are different from each other, an armature having armature windings wound thereon, actuated by an electromagnetomotive force caused by said magnetic poles and moved along said predetermined direction in which said main magnetic poles are disposed, and interpoles disposed at positions located between said adjacent main magnetic poles and facing said armature windings located within a commutating zone, wher~in each of said interpoles comprises an E-shaped three-pole structure disposed on said yoke in said predetermined direction, and spacers of non-magnetic material disposed between said yoke and said interpoles, whereby two magnetic circuits are formed between adjacent poles of each interpole and said armature.

4,220,883

STATOR CORE FOR ELECTRIC MOTOR WITH TRANSFORMER COIL OR THE LIKE INCORPORATED THEREIN BUT MAGNETICALLY ISOLATED THEREFROM

Dante Padoan, Via G Pascoli, 5, 22030 Lipomo, Italy

Filed Sep. 11, 1978, Ser. No. 941,317
Claims priority, application Italy, Nov. 7, 1977, 22654/77[U]
Int. Cl.[2] H02K *1/12*
U.S. Cl. 310—216 **8 Claims**



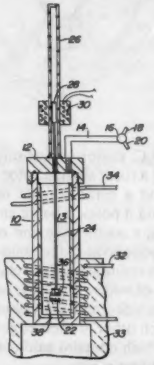
1. A stator assembly for an alternating current electric motor having a secondary coil, such as an auto-transformer coil or a choke coil, for varying the operating characteristics of the motor, said second coil being substantially magnetically separate from the main windings of the motor, said motor further having a single core which serves both as the core for the main windings of said motor and as the magnetic core of said second coil, said core comprising a plurality of laminations made of suitable magnetic material, each of said laminations being so structured so that with said laminations assembled in a stack they form a bore for reception of a rotor and means for receiving coils of wire which constitute the main windings of said motor, each of said laminations further having one or more openings therein so that upon said laminations being stacked in said stack said openings form a receptacle for reception of said secondary coil, said core further including means enabling said secondary coil to operate substantially without disturbing the flux of said main windings of the motor.

4,220,884

CARBON BRUSH FOR MOTORS AND METHOD OF MAKING THE SAME

James H. Sternbergh, Rochester, N.Y., assignor to TRW, Inc., Cleveland, Ohio

Filed May 1, 1978, Ser. No. 901,472
Int. Cl.[2] H02K *13/00*; H01B *1/04*; B05D *1/12*; B32B *9/00*
U.S. Cl. 310—251 **23 Claims**



1. A carbon contact brush for a dynamo-electric device consisting essentially of a body of porous carbon and a metal filling at least a portion of the pores, said metal being selected from the group consisting of tin and alloys of tin with any one of the metals lead, zinc, and silver, and combinations thereof.

9. In a dynamo-electric device which is capable of operating while submerged in gasoline, a commutator brush consisting essentially of a body of porous carbon impregnated with a metal selected from the group consisting of tin and alloys of tin with any one of the metals lead, zinc, and silver, and combinations thereof.

16. A method of making a carbon contact brush for a dynamo-electric device comprising the steps of

melting a metal of the group consisting of tin, and alloys of tin with lead, zinc and silver, and combinations thereof,

immersing a porous carbon body in the metal to impregnate it with the molten metal,

removing the body from the molten metal and cooling the body to solidify the metal therewithin.

4,220,885

TUNING FORK MOUNTING WITH DAMPING MEANS

Yoshimasa Yamashita, Kameoka, and Takeshi Nakamura, Uji, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 7, 1979, Ser. No. 18,229
Claims priority, application Japan, Mar. 17, 1978, 53/35068[U]
Int. Cl.[3] H01L *41/08*
U.S. Cl. 310—321 **9 Claims**

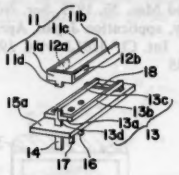
1. A tuning fork comprising:

a tuning fork vibrator of approximately U shape having a

stem and a pair of vibratory arms extending from said stem;

a piezoelectric element disposed on one of said vibratory arms of said tuning fork vibrator;

a damping member firmly secured to said stem of said tuning fork vibrator; said damping member comprising at least one damping piece extending in the same direction as said vibratory arms of said tuning fork vibrator, said damping piece being of such shape and material as will cause it to



cancel the $(\frac{1}{3})f_0$ spurious response of said tuning fork vibrator during vibration of said tuning fork vibrator;

a housing for accommodating said tuning fork vibrator; said damping member being secured to said housing; and

a first and a second terminal piece secured to said housing, said first terminal piece being electrically connected to said stem of said tuning fork vibrator through said damping member and said second terminal piece being electrically connected to said piezoelectric element.

4,220,886

ELECTROACOUSTIC SANDWICH TRANSDUCER WITH BONDED JOINTS

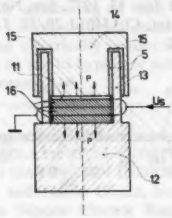
Tadeusz Ciszewski, and Tadeusz Gudra, both of Wroclaw, Poland, assignors to Politechnika Wroclawska, Wroclaw, Poland

Continuation of Ser. No. 805,162, Jun. 9, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 940,153

Claims priority, application Poland, Jun. 16, 1976, 190511

Int. Cl.[3] H01L *41/08*

U.S. Cl. 310—325 **3 Claims**



1. An improved electroacoustic sandwich transducer employing metallic blocks having at least one layer of piezo-electric material sandwiched between said blocks, said layer being provided with metal sprayed on said layer faces for conducting voltage supplied to the said face; an electric insulating material introduced between said blocks and said layers of piezo-electric material; a transducer defined by at least one block being provided with at least one projecting element, said projecting element adjoining an opposite metallic block and connected thereto by means of a binding substance whereby, stresses generated between the layers of piezo-electric material and metallic blocks originate in said piezo-electric material, said improvement comprising: said projecting element being concave and said opposite block having a cooperating concave element to allow contact between the respective elements at respective contact surfaces which are perpendicular to the surface of the piezo-electric layer, said piezo-electric material is between said blocks under compression and said binding substance being perpendicular to faces of said layers of piezo-electric material, thereby subjecting said layers to shearing forces formed in said piezo-electric material.

4,220,887

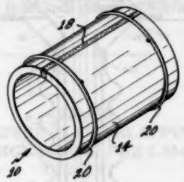
PRESTRESSED, SPLIT CYLINDRICAL ELECTROMECHANICAL TRANSDUCER

Harry W. Kompanek, 153 Rametto Rd., Santa Barbara, Calif. 93108

Filed Nov. 30, 1978, Ser. No. 965,176

Int. Cl.[2] H01L *41/10*

U.S. Cl. 310—334 **14 Claims**



11. In an electromechanical transducer,

a transducer member having a split configuration to provide for a conversion between electrical energy and mechanical vibrations of the member, and

means disposed in the split in the transducer member for prestressing the transducer member outwardly to limit the inward vibrations of the transducer member.

4,220,888

DOUBLE AND TRIPLE ROTATED QUARTZ PLATES FOR SURFACE WAVES

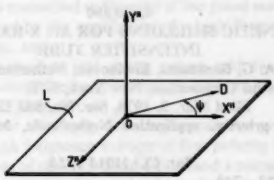
Jean-Jacques Gagnepain, Recologne; Daniel Hauden, Besancon; Claude Pegeot, Sartrouville, and Monique Michel, Ostwald, all of France, assignors to Quartz et Electronique, Asnieres, France

Filed May 25, 1979, Ser. No. 42,648

Claims priority, application France, May 25, 1978, 78 15560

Int. Cl.[2] H01L *41/18*

U.S. Cl. 310—361 **8 Claims**



1. A quartz plate for surface waves, said plate being defined by a reference OXYZ in which the angles OX, OY and OZ are respectively an electrical axis, a mechanical axis and the optical axis of a crystal, wherein said plate is cut with a double rotation defined by two angles ϕ and θ, ϕ being an angle of first rotation about the optical axis OZ and θ being an angle of second rotation about an axis OX' which forms the angle ϕ with the electrical axis OX after the first rotation, the angle of first rotation ϕ lying between 6° and 10° inclusive, the angle θ lying between −41°45' and −38°55'inclusive and the angles ϕ and θ satisfying the equation:

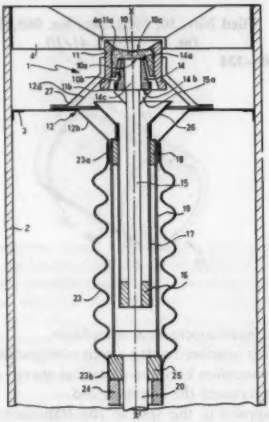
$$47°34' \leq \phi - \theta \leq 48°50'$$

4,220,889

CATHODE FOR AN ELECTRON GUN

Gerard Marhic, Chaumont en Vexin, and Philippe Martin, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1979, Ser. No. 14,832
Claims priority, application France, Mar. 1, 1978, 78 05813
Int. Cl.[2] H01J 1/15, 19/16
U.S. Cl. 313—38 15 Claims



13. A cathode for an electron gun, the cathode comprising, in combination:

a cup-shaped cap member of circular cross-section, the cap member having an internal recess and being of a material capable of emitting electrons at an elevated temperature;

support means for maintaining the cap member in rigid relationship with the electron gun;

a heater element of high electric resistivity at least partially disposed within the recess in the cap member;

mounting means for maintaining the heater element in abutting relationship with the cap member; and

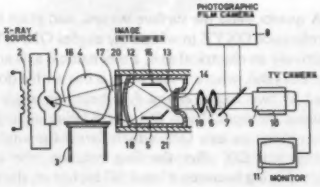
shielding means in close juxtaposition with the heater element for intercepting thermal radiation therefrom.

4,220,890

MAGNETIC SHIELDING FOR AN X-RAY IMAGE INTENSIFIER TUBE

Antonius A. G. Beekmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,132
Claims priority, application Netherlands, Mar. 28, 1977, 7703296
Int. Cl.[2] H01J 1/53
U.S. Cl. 313—240 18 Claims



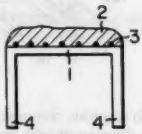
1. An image-forming device, comprising an image intensifier tube having an entrance screen, an exit screen and sides connecting the two screens, which tube includes a magnetic shielding material constructed in a grid configuration, said material being located in front of the entrance screen.

4,220,891

DIRECTLY HEATED CATHODE FOR ELECTRON TUBE

Hisashi Ando; Ko Soeno; Hiroshi Sakamoto, all of Hitachi; Testuo Oyama, Takahagi; Takao Kawamura, and Hiroshi Fukushima, both of Chiba, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 30, 1979, Ser. No. 25,582
Claims priority, application Japan, Apr. 5, 1978, 53-39202
Int. Cl.[2] H01J 1/14, 19/06
U.S. Cl. 313—345 6 Claims



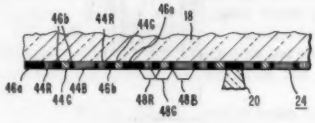
1. A directly heated cathode for electron tube, which comprises a base metal of an alloy consisting essentially of 20–30% by weight of tungsten and a trace amount to 0.25% by weight of zirconium, the balance being nickel, binder dots of metallic nickel powders distributed on a flat part at the front side of the base metal, and a layer of thermoelectron emission oxides laid on the flat part at the front side of the base metal, the layer of thermoelectron emission oxides being in direct contact with the flat part through clearances among the binder dots of metallic nickel powders.

4,220,892

PHOSPHOR SCREEN FOR MODULAR FLAT PANEL DISPLAY DEVICE

John A. van Raalte, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,282
Int. Cl.[2] H01J 29/32, 31/20
U.S. Cl. 313—422 11 Claims



1. In a flat display device which includes an evacuated envelope having a plurality of spaced support walls extending to a phosphor screen bearing wall and forming channels therebetween, means for generating beams of electrons and means for directing at least one beam in each of said channels across said phosphor screen, the improvement comprising,

said phosphor screen including repetitive groups of bodies of different color emitting phosphors in spaced apart relation across the screen a selected one of the color emitting phosphor bodies in some of said groups being replaced by a body of a nonluminous material, each of the one color emitting bodies which is remaining being of a width substantially equal to the width of the electron beam which impinges on the one color emitting body, each of the other color emitting phosphor bodies being of a width less than the width of the electron beam which impinges on them and the combined width of each of the other color emitting bodies and the spaces on each side of each of said

other color emitting bodies being substantially equal to the width of the electron beam which impinges on said bodies.

4,220,893

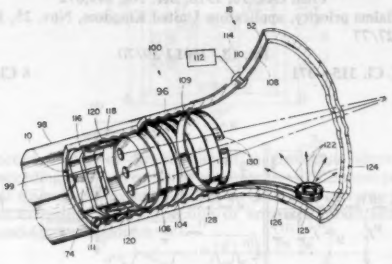
ELECTRICALLY RESISTIVE ARC SUPPRESSOR SHADOWING GETTER FLASH

Philip C. Miller, Morton Grove, and Michael W. Retsky, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 26, 1976, Ser. No. 708,817

Int. Cl.² H01J *29/94, 29/96*

U.S. Cl. 313—450 **17 Claims**



1. In a television cathode ray tube comprising an evacuated envelope including a faceplate and a funnel having on an internal surface an inner conductive coating for receiving a high-voltage charge, said tube further comprising an electron gun located in a neck of the funnel for producing at least one beam of electrons, and getter means within said envelope for projecting, when flashed, getter material effective to capture residual gases in said evacuated envelope in said tube, the improvement comprising an electrically resistive arc-suppression means electrically connected in an electrical path between said inner conductive coating and a high voltage element of said gun, said arc-suppression means having a surface physically exposed to a deposit of said getter material when said getter is flashed, said arc-suppression means including shadowing means distributed across said surface for shadowing at least portions of said exposed surface from a deposit of said getter material to prevent the creation of an electrically conductive shorting path capable of permitting an arc to bypass or substantially nullify said arc-suppression means.

4,220,894

FLUORESCENT DISPLAY PANEL COMPRISING A GRID LEAD HAVING AN INDENT

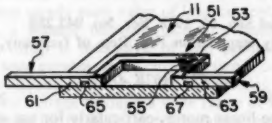
Masaki Kobayakawa, and Toshio Okada, both of Kagoshima, Japan, assignors to Nippon Electric Kagoshima, Limited, Kagoshima, Japan

Filed Nov. 9, 1978, Ser. No. 959,001

Claims priority, application Japan, Nov. 11, 1977, 52-151953[U]

Int. Cl.² H01J *63/02*

U.S. Cl. 313—496 **4 Claims**



1. In a fluorescent display panel comprising a substrate member which has a principal surface having a center area, a first peripheral area on one side of said center area, and a second peripheral area on the other side of said center area, a plurality of anode units on said center area, a plurality of grid members in one-to-one correspondence to said anode units, and a hot cathode over said grid members, each of said grid members comprising a conductive frame, a grid on said frame, and a first and a second grid lead, said grid having a grid surface juxtaposed to the anode unit to which said each grid member is in one-to-one correspondence, said first and said second grid leads being extended from said frame onto said first and said second peripheral areas, respectively, at least one of said first and said second grid leads comprising a deformed portion between the frame and a relevant one of said first and said second portions, said deformed portion being deformed substantially perpendicularly of said grid surface, said deformed protion being thinner than the remaining portion of said at least one grid, wherein said deformed portion comprises an indentation away from said principal surface.

4,220,895

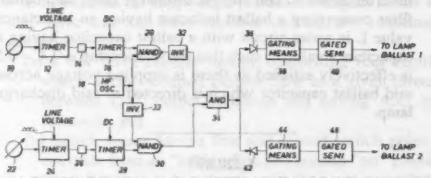
NON-INTERFERING, OVERLAPPING HIGH FREQUENCY SIGNALLING FOR LAMP DIMMER CIRCUIT

Eric L. H. Nuver, San Marcos, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Aug. 25, 1978, Ser. No. 936,883

Int. Cl.² H05B *41/38*

U.S. Cl. 315—195 **12 Claims**



6. In a system for providing lamp dimming to a first lamp circuit and a second lamp circuit, each of said lamp circuits including

a ballast connected to the lamp having an element thereof for at least partial current bypass operation,

a gated semiconductor connected to the element to provide the current bypass operation,

gating means connected to the gate of the gated semiconductor activated by the application of a high frequency control voltage, and

a diode connected to said gating means, said diode in said first lamp circuit being oppositely poled from said diode in said second lamp circuit,

the improvement of a lamp dimming circuit for providing a first burst of high frequency voltage of first polarity for gating the gating means of said first lamp circuit and a second burst of high frequency voltage of second polarity for gating the gating means of said second lamp circuit, said first burst and said second burst being independently variable in time, individual overlapping cycles of said first burst occurring intermediate said second burst, comprising

means for providing a first pulsed square wave voltage at the time of occurrence for said first burst,

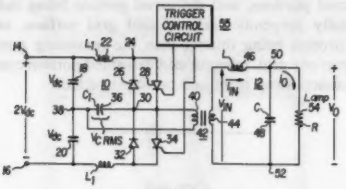
means for providing a second pulsed square wave voltage at the time of occurrence for said second burst, and

chopper means operating at the high frequency and connected to said first square wave voltage means and said second square wave voltage means for providing high frequency control voltages at opposite polarities and a high frequency oscillator connected to said chopper means.

4,220,896
HIGH FREQUENCY LIGHTING INVERTER WITH CONSTANT POWER BALLAST

Derek A. Paice, Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 16, 1978, Ser. No. 934,151
Int. Cl.² H05B 41/29, 41/392
U.S. Cl. 315—205 **7 Claims**



1. A lighting inverter for operating an electric discharge lamp from a direct current (d.c.) power source, comprising:

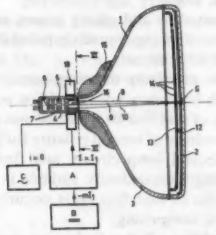
inverter means for converting the output of said d.c. power source to an alternating current (a.c.) output having an operating frequency ω and for regulating the output voltage level of said a.c. output by varying the value of ω thereof;

a ballast filter coupling the regulated output voltage of said inverter means to said electric discharge lamp, said ballast filter comprising a ballast inductor having an inductance value L in series circuit with a ballast capacitor having a capacitance value C, such that the relationship $\omega^2LC=0.5$ is effectively satisfied as there is supplied voltage across said ballast capacitor which is directed to said discharge lamp.

4,220,897
METHOD OF MANUFACTURING A COLOR DISPLAY TUBE AND COLOR DISPLAY TUBE MANUFACTURED ACCORDING TO SAID METHOD

Piet G. J. Barten; Jan Gerritsen, and Kees Tendeloo, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1978, Ser. No. 907,897
Claims priority, application Netherlands, Jul. 6, 1977, 7707476
Int. Cl.² H01J 29/70, 29/76
U.S. Cl. 315—368 **7 Claims**

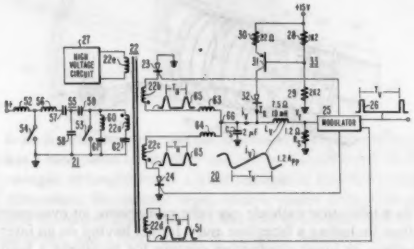


1. A method of manufacturing a color display tube in which magnetic poles are provided in or around the neck of said tube and around the paths of the electron beams, which poles generate a permanent static multipole magnetic field for the correction of errors in convergence, color purity and frame of the display tube, which magnetic poles are formed by the magnetisation of a configuration of magnetisable material provided around the paths of the electron beams, the method comprising energizing a magnetisation device with a combination of direct currents with which a static multipole magnetic field is generated, and superimposing a decaying alternating magnetic field over said static multipole magnetic field which initially drives said magnetisable material into saturation on either side of the hysteresis curve thereof, said decaying alternating magnetic field being generated by a decaying alternating current.

4,220,898
RASTER DISTORTION CORRECTION CIRCUIT

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,672
Claims priority, application United Kingdom, Nov. 25, 1977, 49127/77
Int. Cl.² H01J 29/70
U.S. Cl. 315—371 **6 Claims**



1. A raster distortion correction circuit, comprising:

a horizontal deflection circuit;

a vertical deflection circuit including a vertical deflection winding within which winding a vertical scanning current is developed;

energy transfer means coupled to said horizontal and vertical deflection circuits for obtaining energy for said vertical deflection circuit from said horizontal deflection circuit, said vertical deflection winding tending to cause an undesired decrease in the loading of said horizontal deflection circuit during a top portion of the raster scan and tending to cause an undesired increase in the loading of said horizontal deflection circuit during a bottom portion of the raster scan; and

correction means within said vertical deflection circuit for opposing said undesired decrease in the loading of said horizontal deflection circuit during said top portion and for opposing said undesired increase in the loading of said horizontal deflection circuit during said bottom portion for correcting raster distortion otherwise introduced by the asymmetrical loading tendency of said vertical deflection winding.

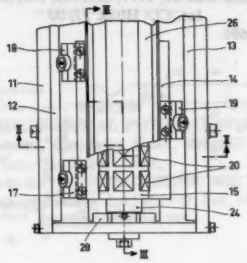
4,220,899
POLYPHASE LINEAR MOTOR

Johann von der Heide, Mönchweiler, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,288
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742050
Int. Cl.² H02K 41/02
U.S. Cl. 318—135 **22 Claims**

1. A polyphase linear motor, particularly for use as a drive motor for peripheral equipment in data-processing installations or the like, the motor comprising a stator and an armature mounted for travel along the length of the stator, the stator including an elongated inner flux-carrying structure extending in the direction of armature travel; a plurality of stationary coils on the inner flux-carrying structure, the stationary coils

being spaced in the direction of armature travel; a plurality of permanent magnet units on the armature, the permanent magnet units being spaced in the direction of armature travel, each permanent magnet unit surrounding the inner flux-carrying structure and the coils on the latter, the magnetic polarity of



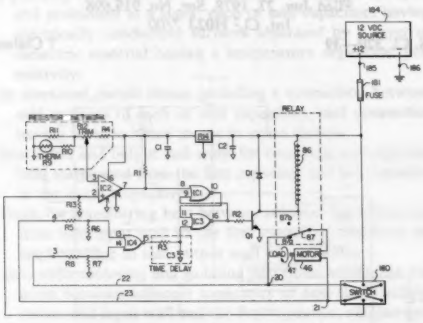
successive ones of the permanent magnet units alternating proceeding in the direction of armature travel from one permanent magnet unit to the next; and an outer flux-carrying structure extending in the direction of armature travel and surrounding the armature.

4,220,900

MOTOR CONTROL SYSTEM FOR A LINEARLY RECIPROCATING LOAD DEVICE SUCH AS AUTOMOTIVE VEHICLE CLOSURE INCLUDING SUN ROOF

Irwin H. Mintz, St. Louis, Mo., assignor to Sky-Top Sunroofs Ltd., St. Louis, Mo.

Filed Jun. 16, 1978, Ser. No. 916,206
Int. Cl.² H02P 3/08
U.S. Cl. 318—266 **8 Claims**



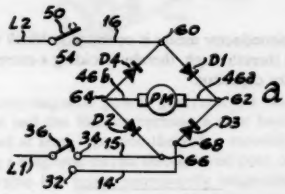
1. A control system for starting and stopping a load device having a predetermined maximum steady state value of load current and a starting current substantially in excess of said steady state load current, a load circuit power source, means for providing a reference voltage which is indicative of said maximum steady state value of load current, said means comprising a resistor network including resistor means whose voltage drop is indicative of said predetermined value of steady state current, and a circuit network comprising temperature compensating means for maintaining accuracy of said reference voltage through a wide range of temperature variation, means for limiting the temperature response at the lower limit of the temperature range and means for limiting the temperature response at the high end of the temperature range, a load resistor in series with said load device, the voltage drop in said load resistor being indicative of the current flowing in said load device, means for comparing said reference voltage and said voltage drop across said load resistor to produce a difference voltage, means responsive to said difference voltage to disable said load device when the steady state current of said load device exceeds the predetermined maximum steady state value and means for delaying the response of said difference voltage responsive means for a predetermined time so that the control system is not responsive to the starting current of said load device.

4,220,901

HALF AND FULL WAVE ENERGIZING SYSTEM FOR PERMANENT MAGNET D.C. MOTORS

Merlin R. Dummer, Arab, Ala., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 27, 1978, Ser. No. 946,182
Int. Cl.² H02P 7/28
U.S. Cl. 318—348 **3 Claims**



1. In a system for supplying a permanent magnet motor with half wave and full wave rectified current, the combination comprising:

(a) a full wave rectifier bridge comprising four rectifiers which afford rectified current flow in a given direction between D.C. output terminals and having A.C. input terminals, and

(b) switch means having first and second switch poles and operable from an "off" to first and second "on" positions, one of said switch poles in said first and second "on" positions connecting one A.C. input terminal to the opposed terminals of two of said rectifiers and the other of said switch poles in said first "on" position connecting the other A.C. input terminal to one terminal of a third rectifier and in the second "on" position connecting said other A.C. input terminal to said one terminal of said third rectifier and an opposed terminal of a fourth rectifier.

4,220,902

ELECTRICAL VEHICLE TRACTION EQUIPMENT

Olle Aronsson; Kjell Frank, and Lars Friden, all of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

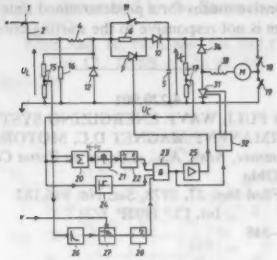
Filed Sep. 20, 1978, Ser. No. 944,521
Claims priority, application Sweden, Sep. 22, 1977, 7710611
Int. Cl.² H02P 3/14
U.S. Cl. 318—434 **9 Claims**

1. Traction apparatus for an electric vehicle of a type wherein energy is supplied from a contact line and passed to a convertor in said vehicle by a current collector, said convertor having a filter capacitor on its input side for smoothing its input current and having an output for supplying energy to a drive motor, the improvement comprising:

controllable semiconductor means connected between said filter capacitor and said current collector for operating in one state to pass current and operating in another state to block the flow of current;

control means for operating said controllable semiconductor means to pass the input current from said current collector to said convertor to drive said vehicle and responsive to a drop in the line voltage supplied to said vehicle to operate said controllable semiconductor means to block the flow of current therethrough;

and current control means operatively associated with said controllable semiconductor means to limit the flow of the input current to said filter capacitor when said controllable semiconductor means is operated to block the flow of current therethrough, thereby avoiding a current surge at said filter capacitor.



4,220,903

SYSTEM FOR GUIDING A TOOL

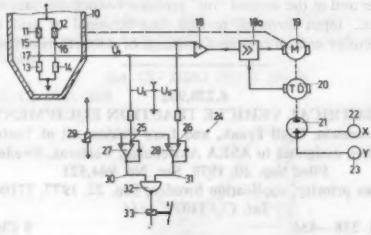
Günter Schumann, Rödermark, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,316

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1976, 2652364

Int. Cl.² G05B *19/36*

U.S. Cl. 318—577 **2 Claims**



1. In a process for guiding a tool in a predetermined direction as well as for producing auxiliary signals wherein a line is scanned photoelectrically with a detector head and the output signals are conducted, by a switching device to a leveling motor for adjusting the detector head and the tool associated with it in a direction tangent to the curve and whereby additionally the line to be scanned has at predetermined locations a width different from the remaining course of the line for the purpose of producing auxiliary signals; the improvement being wherein the line being scanned has a longitudinal axis and is of uniform width on each side of said axis and is of varying width at said predetermined locations, and scanning the line with two photoreceptors, one on each side of the line symmetrically disposed with respect to said longitudinal axis of the line.

4,220,904

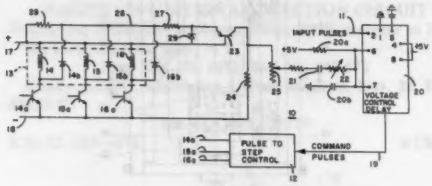
STABILIZING CIRCUIT FOR STEPPING MOTORS WITH UNIPOLAR SELF-DECAY CURRENT CIRCUITRY

Albert C. Leenhouts, Harwinton, and Gurdial Singh, Avon, both of Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed Oct. 26, 1977, Ser. No. 845,757

Int. Cl.² H02K *37/00*

U.S. Cl. 318—696 **14 Claims**



1. A pulse to step motor control circuit comprising a stepping motor having a plurality of unipolar windings, means for receiving a command pulse and essentially simultaneously changing the energization of the windings with the change deenergizing one winding and energizing another winding with a decay current being created in the deenergized winding, means for sensing the quantity of the decay current produced in the deenergized winding and producing a signal related thereto, means for normally providing command pulses and means for shifting the time when the command pulses are produced in accordance with the signal of the sensed quantity of the decay current.

4,220,905

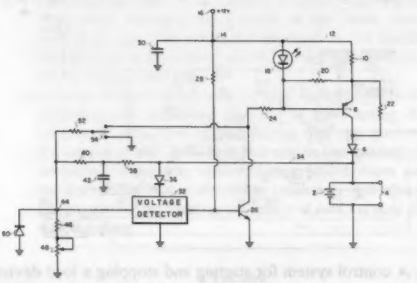
BATTERY CHARGER

William T. Quarton, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 27, 1978, Ser. No. 919,698

Int. Cl.² H02J *7/00*

U.S. Cl. 320—39 **7 Claims**



1. A battery charger circuit comprising:

a pair of terminals for connection to a battery,

a source of charging current for said battery,

control means connected between said source and said terminals for controlling the charging current from said source to said battery,

a voltage sensing circuit, including a voltage detector module, connected to said pair of terminals to be responsive to the terminal voltage of said battery, said voltage detector being characterized by having a negligible current drain,

said control means including a first means for controlling said charging current in a first mode at a relatively high rate, and second means for controlling said charging current in a second mode at a relatively low rate,

said control means being connected to be responsive to an

output signal from said voltage sensing circuit for controlling the mode of operation in accordance with the sensed terminal voltage at said battery terminals.

4,220,906

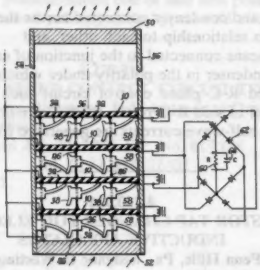
DIELECTRIC THERMAL POWER CONVERTER

James E. Drummond, Coronado, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 605,346, Aug. 18, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,836

Int. Cl.[2] H02N *1/00*

U.S. Cl. 322—2 A 14 Claims



1. A dielectric thermal power converter comprising:

a plurality of capacitors, said capacitors being spaced apart and positioned in a stack, each of said capacitors having electrically conductive surfaces separated by a layer of dielectric material having a temperature dependent permittivity;

an electrical circuit means including a connection between said surfaces of each of said capacitors, said connection having an inductance means in series therein;

heat input and output end walls for receiving and rejecting heat and spaced from the first capacitor and last capacitor in the stack, respectively;

fluids for transferring heat between adjacent capacitors and from said input wall to the first capacitor, and from the last capacitor to said output wall of said stack;

side walls enclosing and isolating said fluids within the volumes between adjacent capacitors of said stack and between said input wall and the first capacitor, and between the last capacitor and said output wall of said stack;

switching means positioned intermediate said adjacent spaced capacitors and between said heat input wall and the first capacitor, and between the last capacitor and said heat output wall of said stack and adapted to synchronously open and close to alternately communicate and block vapor flow, respectively, between adjacent surfaces to thereby cycle heat input and output of the dielectric material of each of said capacitors in synchronism with discharging and charging of each capacitor, respectively;

wicks positioned intermediate said spaced, adjacent capacitors and between said heat input wall and the first capacitor, and between the last capacitor and said output wall of said stack and adapted to conduct liquid between adjacent surfaces; and,

means associated with said inductance means for driving an electrical load.

4,220,907

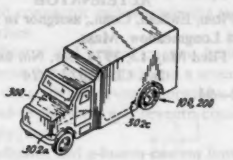
ELECTROMAGNETIC POWER GENERATOR

Dennis G. Pappas, 200 E. 58th St., New York, N.Y. 10022; Matthew C. Baum, Westwood, N.J.; Samuel N. Small, Valley Stream, N.Y.; Robert T. Adams, Short Hills, N.J., and Robert P. Freedman, East Northport, N.Y., assignors to Dennis G. Pappas, New York, N.Y.

Division of Ser. No. 719,325, Aug. 31, 1976, Pat. No. 4,126,772. This application Jul. 27, 1978, Ser. No. 928,525

Int. Cl.[2] H02K *35/00*

U.S. Cl. 322—3 4 Claims



1. An electro-magnetic power generator for use inside a vehicular tire and the like, comprising a core having a coil wound around at least a portion thereof; a movable bar normally closing a magnetic circuit through said core; one of said core or movable bar being permanently magnetized, and a flexible restraining member constrained to follow movement of the inner tire periphery, holding with one of its portions said movable member and holding said core with another of its portions, intermittently to move the movable member away from said core during rotation of the tire when the same slightly flattens upon contact with the ground, whereupon magnetic attraction pulls back said bar to said core, and a small electromotive force is induced in said coil.

4,220,908

AUTOMOTIVE BATTERY CHARGING SYSTEM

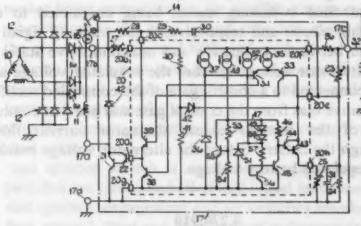
Thomas Nicol, Lichfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 27, 1978, Ser. No. 919,678

Claims priority, application United Kingdom, Jul. 2, 1977, 27808/77

Int. Cl.[2] H02J *7/14*; H02P *9/00*

U.S. Cl. 322—33 16 Claims



1. An automotive battery charging system comprising a generator having a field winding and output terminals connected to the battery and a voltage regulator controlling the field current, said voltage regulator including a battery voltage sensitive input stage coupled to an output stage which is in series with the field winding, said input stage including first and second resistors in series across the battery, the voltage at the junction of said resistors determining whether the output stage is conductive, or not, and a temperature compensation circuit for varying the voltage at said junction independently of the battery voltage and including a first transistor having its

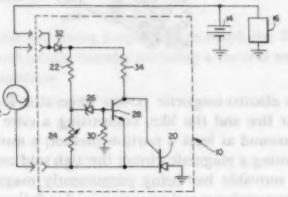
collector-emitter path in series with a third resistor across said second resistor and a temperature sensing circuit controlling the base voltage of said transistor so as to reduce such voltage substantially linearly with increasing temperature up to a predetermined upper temperature at which said output transistor ceases to conduct, the first and third resistors being adjusted to determine the height and slope of the temperature characteristics of the regulator.

4,220,909

HALF-WAVE REGULATOR RECTIFIER FOR AN ALTERNATOR

Michael J. Piteo, Enfield, Conn., assignor to R. E. Phelon Company, East Longmeadow, Mass.

Filed May 13, 1976, Ser. No. 686,144
Int. Cl.[2] H02J *7/14*
U.S. Cl. 322—94 **19 Claims**



1. A regulator rectifier for an alternator producing alternate positive and negative voltage waveforms between output terminals connected in a circuit for charging a battery to a regulated battery voltage during the positive waveform comprising:

a controlled rectifier connected as a rectifying element between one terminal of the alternator and one terminal of the battery;

control circuit means for controlling forward conduction of the controlled rectifier during the positive waveform of the alternator including controlled switching means having conductive and nonconductive conditions and an alternator voltage tracking circuit;

the tracking circuit being connected across the alternator terminals to monitor the alternator voltage independently of the battery voltage, and producing a signal tracking the positive voltage waveform of the alternator in the vicinity of the regulated battery voltage,

the controlled switching means being connected to the tracking circuit and responsive to the tracking signal to switch between conductive and nonconductive states as the alternator voltage reaches the regulated voltage and also connected to a control gate of the controlled rectifier to remove bias from the control gate and prevent conduction of the rectifier unless alternator current flows through the battery before the alternator voltage reaches the regulated battery voltage.

4,220,910

RAISING-PRESSURE DELAY TYPE ELECTROMAGNETIC PUMPS

Yasutsune Chiba; Shizuo Arima; Shoji Suzuki, and Masayuki Saitoh, all of Tokyo, Japan, assignors to Taisan Industrial Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1977, Ser. No. 866,043
Claims priority, application Japan, Jul. 21, 1977, 52/96494[U]
Int. Cl.[2] H05B *39/02*
U.S. Cl. 323—19 **2 Claims**

1. An electromagnetic pump arranged to be driven by rectified half-wave currents from a power source, comprising:

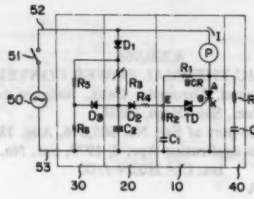
a power source;

a pump coil connected in series with said power source;

a silicon controlled rectifier connected in series with said pump coil;

a trigger diode connected to the gate of said silicon controlled rectifier;

an R-C phase control circuit connected between the anode and the cathode of said silicon controlled rectifier for controlling the firing point thereof in association with said trigger diode;



a resistor and condenser connected across the power source in series relationship to each other; and

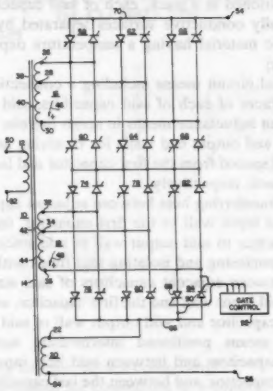
a diode means connected to the junction of said resistor and said condenser in the polarity under which current flows into said R-C phase control circuit such that the base potential of said R-C phase control circuit is raised stepwise as half-wave currents are generated from said power source.

4,220,911

THYRISTOR TAP CHANGER FOR ELECTRICAL INDUCTIVE APPARATUS

John Rosa, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1978, Ser. No. 940,809
Int. Cl.[2] G05F *5/00*
U.S. Cl. 323—43.5 S **4 Claims**



1. A switching circuit comprising:

first and second terminals;

an electrical inductive winding having first and second ends and an intermediate tap dividing said winding into first and second sections, said first and second sections providing different output voltages, said first and second sections each having first and second opposing polarity directions;

first and second switching means respectively connected between said first end of said winding and said first and second terminals;

third and fourth switching means respectively connected between said intermediate tap of said winding and said first and second terminals;

fifth and sixth switching means respectively connected between said second end of said second winding and said first and second terminals;

each of said first, second, third, fourth, fifth and sixth switching means including a pair of triggerable semiconductive devices connected in inverse parallel configuration and providing, when triggered, two opposing unidirectional conducting paths; and

control means, operably connected to said first, second, third, fourth, fifth and sixth switching means for controlling the triggering of said first, second, third, fourth, fifth and sixth switching means;

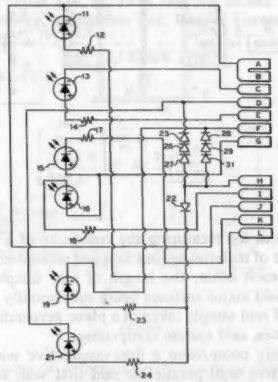
said control means maintaining a conductive path between said first and second terminals when said switching circuit is operating by triggering a selected one of said first, third and fifth switching means and a selected one of said second, fourth and sixth switching means so as to connect said first section of said winding into said circuit in a predetermined one of said first polarity direction, said second polarity direction or to bypass said circuit and to connect said second section of said winding into said circuit in a predetermined one of said first polarity direction, said second polarity or to bypass said circuit.

4,220,912

VEHICLE SPEED CONTROL CIRCUIT TESTER

James A. Williams, Richmond, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 20, 1977, Ser. No. 817,186
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **3 Claims**



1. An apparatus for testing the current path integrity and operation of a speed control circuit having wiring harness and associated electrical components, the circuit including a first circuit connector connected to the ground potential of a power supply, a road speed coil connected between a second circuit connector and a third circuit connector, a normally closed set switch connected between a fourth circuit connector and a fifth circuit connector, and a normally open engagement switch connected between the positive potential of the power supply and the fourth circuit connector, the testing apparatus comprising:

a first and a second apparatus connector connected together and to the first and second circuit connectors respectively;

a first visual indicator and a first current limiting means connected in series between a third and a fourth apparatus connector, said third and fourth apparatus connectors being connected to the third and fourth circuit connectors respectively;

a second visual indicator and a second current limiting means connected in series between said first apparatus connector and a fifth apparatus connector, said first and fifth apparatus connectors being connected to the first and fifth circuit connectors respectively, whereby when the engagement switch is closed, said first and second visual indicators indicate the current path integrity of the portions of the speed control circuit including the road speed coil and the set switch respectively;

wherein the speed control circuit includes a normally open ignition switch connected between the positive potential of the power supply and a sixth circuit connector, a feedback potentiometer connected between the second circuit connector and a seventh circuit connector and a brake light circuit element connected between the ground potential of the power supply and an eighth circuit connector and wherein the testing apparatus further comprises:

a third visual indicator and a third current limiting means connected in series between a sixth and a seventh apparatus connector, the sixth and seventh apparatus connectors being connected to the sixth and seventh circuit connectors respectively; and

a fourth visual indicator and a fourth current limiting means connected in series between said sixth apparatus connector and an eighth apparatus connector respectively, said eighth apparatus connector being connected to the eighth circuit connector, whereby when said ignition switch is closed, said third and fourth visual indicators indicate the current path integrity of the portions of the speed control circuit including the feedback potentiometer and the brake light circuit element respectively;

wherein the engagement switch includes a momentary contact resume position connected to a ninth circuit connector, the speed control circuit includes a charge coil connected between a tenth and an eleventh circuit connector and a vent coil connected between the eleventh and a twelfth circuit connector and wherein the testing apparatus further comprises:

a fifth visual indicator and a fifth current limiting means connected in series between a ninth and a tenth apparatus connector, the ninth and tenth apparatus connectors connected to the ninth and tenth circuit connectors respectively;

a line connected between said first apparatus connector and an eleventh apparatus connector, the eleventh apparatus connector being connected to the eleventh circuit connector; and

a sixth visual indicator and a sixth current limiting means connected between said ninth apparatus connector and a twelfth apparatus connector, said twelfth apparatus connector being connected to the twelfth circuit connector, whereby when the engagement switch is momentarily in the resume position said fifth and sixth visual indicators indicate the current path integrity of the portions of the speed control circuit including the charge coil and the vent coil respectively; and

whereby the correct operation of the speed control circuit is indicated when:

a. said ignition switch is open, said engagement and set switches are closed and all of said visual indicators are off;

b. said ignition, engagement and set switches are closed, said first, second, third and fourth visual indicators are on and said fifth and sixth visual indicators are off;

c. said ignition and engagement switches are closed, said set switch is open, said first, third and fourth visual indicators are on and said second, fifth and sixth visual indicators are off;

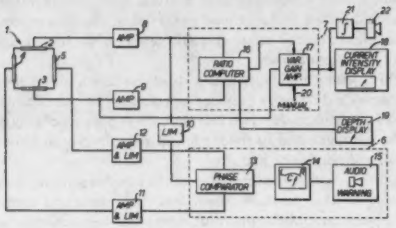
d. said ignition and engagement switches are closed, said set switch is open, said brake light circuit element is actuated, said first, second and third visual indicators are on and said fourth, fifth and sixth visual indicators are off; and

e. said engagement switch is in the resume position, said ignition and set switches are closed and said first through sixth visual indicators are on.

4,220,913
APPARATUS FOR AND METHODS OF ELECTROMAGNETIC SURVEYING OF ELONGATED UNDERGROUND CONDUCTORS

Mark I. Howell, Clifton, and Lloyd H. Sole, Henleaze, both of England, assignors to Electrolocation Limited, Bristol, England

Filed May 23, 1978, Ser. No. 908,855
Int. Cl.[2] G01R *31/08;* G01V *3/08*
U.S. Cl. 324—52 **11 Claims**



1. Apparatus for surveying an underground pipeline or other elongated element which carries, or can be made to carry, AC, the pipeline or element then forming a conductor around which there is a substantially cylindrical electromagnetic field, the apparatus comprising a coil array including a first pair of axially parallel coils arrangeable, in use, one above the other with their axes horizontal and transverse to the conductor; a phase comparator and indicator circuit for distinguishing from the outputs of a selection of coils of said array (such outputs being related to their position and attitude and the electromagnetic field) on which side of the conductor the array lies, a depth correction circuit including means responsive to the combined output of the first pair of coils to provide a correction factor dependent on the depth of the conductor, and a variable gain amplifier whose inputs are the correction factor and the output of one of said first pair of coils, and whose output is that coil output modified by the correction factor in such manner that variations in depth alone of the conductor leaves said output substantially unaffected although it will change according to variations of the electromagnetic field, a discontinuity in that field as the apparatus is progressed along the element corresponding to a fault; and indicator or recording means responsive to said variable gain amplifier output by which any such discontinuities can be determined.

4,220,914
AM-PM CONVERSION FOR MEASURING DELAY DISTORTION

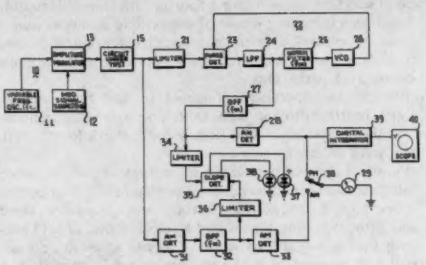
Norris C. Hekimian, Rockville, Md., assignor to Hekimian Laboratories, Inc., Rockville, Md.

Filed Jun. 14, 1978, Ser. No. 915,537
Int. Cl.[2] G01R *27/00;* H04B *1/10*
U.S. Cl. 324—57 DE **20 Claims**

1. A delay distortion measuring instrument comprising:

means for passing an amplitude-modulated test signal through a circuit under test, said test signal being substantially devoid of phase modulation;

means for phase demodulating said test signal to detect phase modulation introduced into said test signal by said circuit under test; and

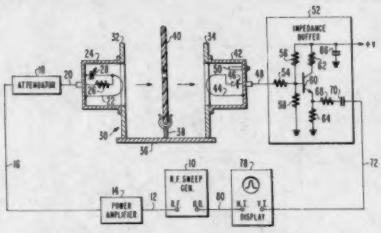


means for measuring delay distortion of said test signal as a function of the detected phase modulation.

4,220,915
RESISTIVITY MEASUREMENT SYSTEM

Hirohisa Kawamoto, Princeton, N.J., and Elmer L. Allen, Jr., Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1978, Ser. No. 920,077
Int. Cl.[2] G01R *27/04, 27/02*
U.S. Cl. 324—58 A **5 Claims**



1. A system for measuring the resistivity of a substantially rigid sample of material having first and second major surfaces parallel to each other, the length of said sample in a plane parallel to said major surfaces being substantially greater than the width of said sample taken in a plane perpendicular to said major surfaces, said system comprising:

an assembly comprising a first conductive wall, a second conductive wall parallel to said first wall and spaced a given distance from said first wall, a conductive base connecting said first and second conductive walls, each of said first and second conductive walls having an aperture and each wall further having a conductive enclosure surrounding the corresponding aperture;

a sweep frequency generator for providing an r.f. signal whose frequency varies across a given band of frequencies including a particular frequency;

means for providing the unguided transmission of said r.f. signal including a transmitting antenna, said transmitting antenna being enclosed in said first wall conductive enclosure such that said r.f. signal is transmitted through the first wall aperture;

means for receiving said r.f. signal including a receiving antenna, said receiving antenna being enclosed in said second wall conductive enclosure such that said r.f. signal is received through said second wall aperture;

conductive means connected to said conductive base between said first and second walls and extending from said base to a level below the apertures in said first and second walls, said conductive means being arranged for retaining

said sample of material such that said sample of material is held parallel to said first and second walls and for retaining said sample of material in a position whereby a substantial portion of said sample of material is in the path of said transmitted r.f. signal, said conductive retaining means, said base and said first and second walls being at ground potential;

detector means connected to said receiving antenna and located within said second wall enclosure for detecting said r.f. signal; and

display means coupled to said detection means and to said r.f. sweep generator for displaying the amplitude characteristic of the detected r.f. signal, said amplitude characteristic providing a measure of the resistivity of said sample of material.

4,220,916

METHOD OF AND APPARATUS FOR DETERMINING THE BREAKDOWN CHARACTERISTICS AND SIZE OF MEMBRANE-SHEATHED PARTICLES SUCH AS CELLS

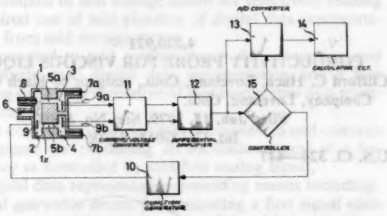
Ulrich Zimmermann, Jülich; Günter Pilwat, Niederzier, and Michael Groves, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkerter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 13, 1979, Ser. No. 29,842

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828232

Int. Cl.² G01N *27/07*

U.S. Cl. 324—71 R **10 Claims**



1. A method of determining the size and dielectric breakdown characteristics of a membrane-sheathed particle and the apparent size thereof after dielectric breakdown which comprises the steps of:

(a) entraining the particles through a measuring passage in an electrolyte solution;

(b) applying across said measuring passage a linearly increasing electric field causing the passage of an electric current through the electrolyte traversing said passage;

(c) detecting the breakdown characteristics of the membrane of the particle upon the increase in the strength of said field;

(d) automatically detecting the change in electric current traversing said passage as a result of the presence of said particle prior to dielectric breakdown of said membrane, thereby ascertaining the size of the particle prior to dielectric breakdown; and

(e) automatically detecting the effect of the particle on said current subsequent to dielectric breakdown to measure the apparent size of the particle subsequent to breakdown of said membrane.

4,220,917

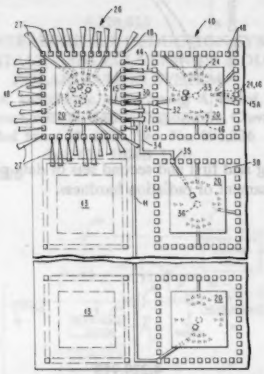
TEST CIRCUITRY FOR MODULE INTERCONNECTION NETWORK

Maurice T. McMahon, Jr., Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,480

Int. Cl.² G01R *31/02, 31/22*

U.S. Cl. 324—73 R **8 Claims**



1. In the fabrication of integrated circuit packages wherein a plurality of semiconductor integrated circuit chips with logic performing circuits thereon are mounted at a plurality of chip sites on an insulative substrate having a network of conductive interconnectors for interconnecting input and output terminals of said plurality of chips, a method of testing the conductive interconnector network after the mounting of said chips which comprises

logically connecting all input terminals of each chip to a common terminal of that chip with semiconductor devices mounted on that chip,

temporarily blocking output signals of said logic performing circuits on said chips from reaching the output terminals of said chips, and

testing for continuity across said input terminals between test points on the interconnector network and/or between said test points and said common terminals.

4,220,918

RADIATION HARDNESS TESTING FOR FIELD EFFECT DEVICES

Michael Pepper, Cambridge, England, assignor to Plessey Handel und Investments AG., Zug, Switzerland

Filed Mar. 22, 1978, Ser. No. 888,989

Claims priority, application United Kingdom, Mar. 26, 1977, 12814/77

Int. Cl.² G01R *31/22*

U.S. Cl. 324—158 T **6 Claims**

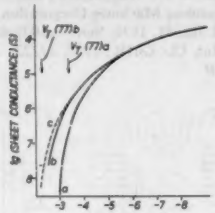
1. A method of testing a field effect device for radiation hardness comprising the steps of:

subjecting the field effect device to a low temperature environment;

developing a first set of data points by measuring the conductance of the field effect device as a function of gate voltage at a first substrate bias;

developing a second set of data points by measuring the conductance of the field effect device as a function of gate

voltage at a second substrate bias, which is different from said first substrate bias; and



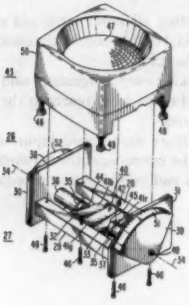
comparing said first and second sets of data points to attain an assessment of radiation hardness.

4,220,919

CATHODE RAY TUBE DISPLAY ERROR MEASUREMENT APPARATUS AND METHOD

Linus C. Ruth, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 958,754
Int. Cl.[2] G01R *31/024*
U.S. Cl. 324—404 **11 Claims**



1. A cathode ray tube display error measuring device, comprising:

a support housing suitable for placing adjacent a phosphor screen of a color cathode ray tube;

first optical means located on said support housing transmitting the light emitted by a first color phosphor group of said color cathode ray tube;

second optical means transmitting the light emitted by a second color phosphor group of said color cathode ray tube; and

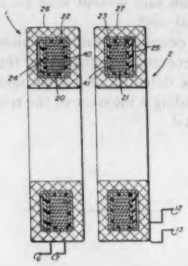
adjustment means coupled to one of said first and second optical means for moving the image of a test pattern generated on said phosphor screen formed by said first optical means into alignment with the image of said test pattern formed by said second optical means.

4,220,920

ELECTRODELESS CONDUCTIVITY MEASURING SYSTEM

Thomas A. O. Gross, Lincoln, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 28, 1979, Ser. No. 24,554
Int. Cl.[2] G01N *27/07*
U.S. Cl. 324—442 **7 Claims**



1. An electrodeless conductivity probe, comprising first and second toroidal ferromagnetic cores, means mounting said cores in spaced relationship, a first and a second shield of electrically conductive, non-permeable material partially surrounding said first and said second cores, respectively, a first winding over said first shield and linking said first core, and a second winding over said second shield and linking said second core.

4,220,921

CONDUCTIVITY PROBE FOR VISCOUS LIQUIDS

Clifford C. Hach, Loveland, Colo., assignor to Hach Chemical Company, Loveland, Colo.

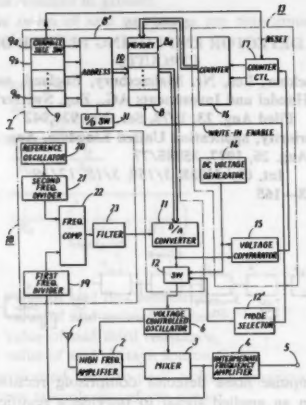
Filed Jan. 15, 1979, Ser. No. 3,600
Int. Cl.[2] G01N *27/06*
U.S. Cl. 324—447 **2 Claims**

1. In a conductivity probe, the combination comprising, a non-conductive body, a pair of electrodes mounted on the surface of said body, an open-sided groove providing a path connecting said electrodes, a non-conductive wall slidably mounted on said body for movement between a rest position closely covering said groove and an open position completely opening said groove, means for biasing said wall towards said rest position, and said body and wall having portions permitting one-handed movement of the wall against said bias to said open position.

4,220,922
PRESET TUNER

Shigehiko Ikeguchi, Gunma, Japan, assignor to Sanyo Electric Co. Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Jan. 18, 1978, Ser. No. 870,670
Claims priority, application Japan, Jan. 25, 1977, 52-8290
Int. Cl.[2] H04B 1/26
U.S. Cl. 455—182 22 Claims



1. A preset tuner adapted for selecting a desired one out of a plurality of preset channels, comprising:

storage means for storing a plurality of digital data representations each associated with one of said plurality of preset channels,

means coupled to said storage means for providing to said storage means said digital data representations,

means coupled to said storage means for selectively reading a desired one of said plurality of digital data representations from said storage means,

means coupled to said reading means for converting said selectively read digital data representation into a first analog signal representative of said read digital data representation,

voltage controlled oscillator means coupled to said converting means for producing an oscillation signal at a frequency as controlled by said first analog signal,

said digital data representation providing means including:

signal generator means for generating a first signal commensurate with a voltage control signal for said voltage controlled oscillator means for producing an oscillation signal at a frequency corresponding to the local oscillation frequency of a desired channel, and

means coupled to said storage means for generating a digital data representation associated with said first signal from said signal generator means,

means for selecting a presetting mode and a channel selecting mode,

switching means coupled to said mode selecting means for providing said first signal from said signal generator means in said presetting mode and providing said first analog signal from said converting means and to said voltage controlled oscillator means in said channel selecting mode,

means for receiving a high frequency signal,

mixer means coupled to said high frequency signal receiving means and said voltage controlled oscillator means for mixing said received high frequency signal and the oscillation signal from said voltage controlled oscillator means for providing an intermediate frequency signal,

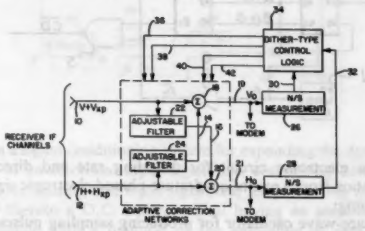
means coupled to said storage means responsive to said intermediate frequency signal for detecting frequency deviation of said intermediate frequency signal for producing a signal representative of frequency deviation of said intermediate frequency signal, and

means coupled to said frequency deviation signal producing means and responsive to said frequency deviation signal for compensating said converted first analog signal to correct the frequency deviation of said intermediate frequency signal.

4,220,923
ADAPTIVE INTERFERENCE REDUCTION SYSTEM FOR CROSSTALK CANCELLATION IN A DUAL POLARIZATION SYSTEM

Guy M. Pelchat, Indialantic, and Charles A. Baird, Palm Bay, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 29, 1978, Ser. No. 891,336
Int. Cl.[2] H04B 1/10
U.S. Cl. 455—295 36 Claims



5. An adaptive correction network for decoupling a first and second signals comprising:

a first adjustable filter receiving said first signal and adjusting its weight and phase;

a second adjustable filter receiving said second signal and adjusting its weight and phase;

first adder means for adding said first signal and the weighted and phase adjusted output from said second adjustable filter to thereby subtract cross-coupling components from said first signal;

second adder means for adding said second signal and the weighted and phase adjusted output from said first adjustable filter to thereby subtract cross-coupling components from said second signal;

first noise-to-signal measuring means for generating a signal proportional to the noise-to-signal ratio in the output signal from said first adder means;

second noise-to-signal measuring means for generating a signal proportional to the noise-to-signal ratio in the output signal from said second adder means; and

control means for generating signals in accordance with the signals generated by said first and second noise-to-signal measuring means to control said first and second adjustable filters;

wherein said first and second adjustable filters each comprise:

first means for generating a signal from an input signal which is constant in magnitude and phase;

second means for generating from said input signal a signal with magnitude and phase terms which vary linearly with frequency across a predetermined frequency bandwidth, the precise linearity variation with frequency of the magnitude and phase of the generated signal being controlled by control signals from said control means;

third means for generating from said input signal a signal with magnitude and phase terms which vary quadratically with frequency across said predetermined frequency bandwidth, the precise quadratic variation with frequency of the magnitude and phase of the generated signal being controlled by control signals from said control means;

third adder means for combining the output signals from said first, second and third means for application to said first or second adder means.

4,220,924

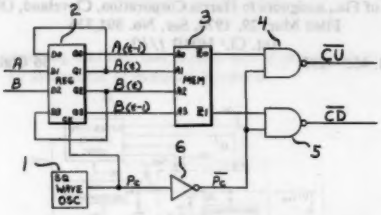
DIGITAL PHASE DECODING TECHNIQUE FOR QUADRATURE PHASED SIGNALS

Robert Osann, Jr., 22483 Riverside Dr., Cupertino, Calif. 95014

Continuation-in-part of Ser. No. 713,854, Aug. 12, 1976, Pat. No. 4,079,251. This application Mar. 16, 1978, Ser. No. 887,072

Int. Cl.² H03K *13/00*

U.S. Cl. 328—119 **1 Claim**



1. An electronic circuit for decoding rate and direction information from a pair of quadrature-phased electronic signals comprising:

a square-wave oscillator for producing sampling pulses;

first register means responsive to said quadrature-phased signals and to said sampling pulses for storing sampled states of said quadrature-phased electronic signals;

second register means responsive to said first register means and said sampling pulses for storing the sampled states of said quadrature-phased signals which had been previously stored by said first register means;

static memory means connected to perform a comparing operation on the outputs of said first and second register means; and

digital logic means responsive to said static memory means and said sampling pulses providing appropriate signals for incrementing or decrementing an up/down counter means according to the comparison performed by said static memory means.

4,220,925

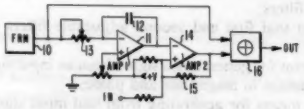
ENCODING ANALOG SIGNALS INTO DIGITAL SIGNALS USING A TRIANGULAR REFERENCE

Chin Tao Wu, N. Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,557

Int. Cl.² H04B *1/00*; G11B *5/00*

U.S. Cl. 328—150 **9 Claims**



1. A system for encoding an input analog signal having a highest frequency component f_H and comprising:

means for supplying square wave signals having a given period T and upper and lower levels of constant and equal duration;

means for supplying triangular signals in phase with said square wave signals and having said given period T less than $1/f_H$;

modulator means responsive to said triangular signals and to said input analog signal for producing pulses at a rate equal to 1/T and whose widths are proportional to the amplitude of said input analog signal at the times of equality therebetween; and

gating means receiving as input signals thereto said square wave signals and said pulses for producing an output signal at one level when the logical values of the input signals thereto are the same and of another level when the logical values of the input signals thereto are different.

4,220,926

NOISE DETECTOR EMPLOYING PLURAL DELAY CIRCUITS

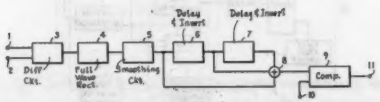
Ian W. Buckner, Lea, Nr. Malmesbury, England, assignor to Plessey Handel und Investments AG., Zug, Switzerland

Filed Aug. 23, 1978, Ser. No. 935,942

Claims priority, application United Kingdom, Aug. 26, 1977, 35984/77; Aug. 26, 1977, 35985/77

Int. Cl.² H03K *5/159, 5/18, 17/16*

U.S. Cl. 328—165 **5 Claims**



1. An impulse noise detector comprising rectifier means operable on an applied signal to provide a rectified signal, smoothing means for smoothing the rectified signal, a plurality of delay means for operating on the smoothed signal to afford a corresponding plurality of time delayed signals, and means for selectively combining the corresponding plurality of time delayed signals to afford an output which is indicative of the presence, in the applied signal, of impulse noise;

wherein each of the plurality of delay means operates in accordance with a function

$$e^{-s}=e^{-ks}/e^{-(k-1)s}$$

where

$0<k<1$

e=the exponential function of approximately 2.718

s=the complex frequency variable.

4,220,927

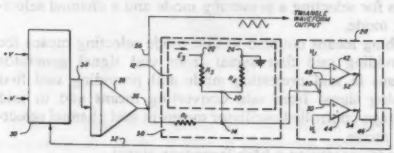
ELECTRICAL SIGNAL CONVERTER USABLE IN TRIANGULAR WAVEFORM GENERATION

William R. Austin, Binghamton, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Apr. 20, 1978, Ser. No. 898,033

Int. Cl.² H03K *4/10*

U.S. Cl. 328—181 **2 Claims**



1. In a triangle waveform generator comprising an integrator, a detector/control, and a switch wherein the integrator integrates the output of the switch, and the switch is controlled by the detector/control which, in turn, provides a switch command to the switch when the integrator output voltage is at either a predetermined upper voltage limit or lower voltage limit, an improvement for controlling the peak-to-peak voltage

magnitude and DC offset voltage of the integrator triangle waveform output, comprising:

(a) a first resistance, R_1, serially connecting the output of the integrator to the input of the detector/control;

(b) a voltage source providing a predetermined voltage, E_0;

(c) a second resistance, R_3, serially connecting the output of said voltage source to the input of the detector control; and

(d) a third resistance, R_4, serially connecting the input of the detector/control to ground;

wherein the ratios of said resistances are determined by the following relationships:

$$R_1 = \frac{\Delta e_1}{\Delta e_n}$$

$$R_3 = \frac{E_0}{\frac{e_{np}}{R_n} - \frac{e_{lp}}{R_1}}$$

$$R_4 = \frac{1}{\frac{1}{R_n} - \left(\frac{1}{R_1} + \frac{1}{R_3}\right)},$$

where

R_1=the value of said first resistance,

R_3=the value of said second resistance,

R_4=the value of said third resistance,

E_0=the value of said voltage source,

Δe_1=the desired peak-to-peak voltage magnitude of the integrator triangle waveform output,

Δe_n=the difference between the predetermined upper voltage limit and lower voltage limit,

e_{np}=the predetermined upper voltage limit,

e_{lp}=the desired upper peak voltage of the integrator triangle waveform output, and

R_n=1.

4,220,928

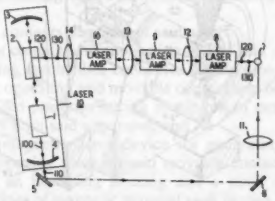
ADAPTIVE CORRECTION OF LINEAR PHASE ABERRATIONS IN LASER AMPLIFIER SYSTEMS

David M. Bloom, Holmdel, and Paul F. Liao, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 23, 1978, Ser. No. 908,773

Int. Cl.[2] H01S *3/10, 3/30*

U.S. Cl. 330—4.3 **10 Claims**



1. In combination:

a medium having a third-order nonlinearity in susceptibility;

means for providing counterpropagating pump beams in said medium, said pump beams having substantially the same frequency;

means for irradiating said medium with an object beam having a frequency component substantially equal to the frequency of said pump beams, which object beam spatially and temporally overlaps said pump beams in said medium; and

means, placed in the path of said object beam, for extracting a beam that is counterpropagating in the path of said object beam;

characterized in that said means for providing counterpropagating pump beams includes

means for providing nonplanar counterpropagating pump beams such that the product of the amplitudes of said pump beams has a phase which is spatially independent.

4,220,929

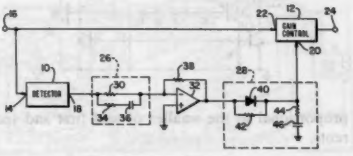
SIGNAL EXPANDER

Daniel B. Talbot, Hudson, Mass., and David E. Blackmer, Wilton, N.H., assignors to DBX, Inc., Newton, Mass.

Filed Dec. 26, 1978, Ser. No. 973,019

Int. Cl.[2] H03G *7/00*

U.S. Cl. 330—136 **12 Claims**



1. In a signal conditioning system for expanding the dynamic range of an electrical input signal and comprising detection means for sensing said input signal and for producing responsively thereto a D.C. control signal having an amplitude in accordance with a function of the amplitude of said input signal, amplification means for amplifying said input signal, said amplifier means including means for controlling the gain of said amplification means as a function of said amplitude of said control signal, the improvement comprising:

means for varying said amplitude of said control signal at least in part as a function of the time derivative of said amplitude so as to modify said control signal, said means for varying said amplitude of said control signal including circuit means having an input terminal for receiving the output of said detection means and an output terminal, said circuit means including a first transmissive path between said input and output terminals and a second transmissive path, parallel to said first transmissive path, between said input and output terminals, at least one of said transmissive paths being variably transmissive as a function of said time derivative.

4,220,930

QUASI-LINEAR AMPLIFIER WITH FEEDBACK-CONTROLLED IDLING CURRENTS

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,457

Int. Cl.[2] H03F *3/30*

U.S. Cl. 330—270 **22 Claims**

20. A circuit for sensing the smaller of first and second currents comprising:

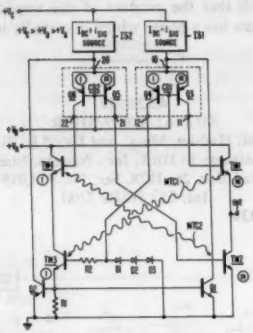
first and second terminals for receiving an operating potential therebetween,

first and second transistor means having respective input and output and common electrodes and exhibiting similar current gains between their respective input and output electrodes, each of said transistor means having its principal current conduction path between its output and common electrodes,

means for respectively applying said first and second currents to separate ones of the input electrodes of said first and second transistor means;

a current sensing resistance in series connection with the

principal current conduction paths of said first and second transistor means, the potential drop thereacross being



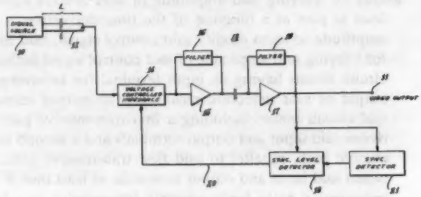
proportional to the smaller of said first and second currents.

4,220,931

COMPOSITE VIDEO AUTOMATIC GAIN CONTROL AMPLIFIER

William E. Hines, Chaska, and Verne L. Severson, Minneapolis, both of Minn., assignors to Northern Telecom Systems Corporation, Minnetonka, Minn.

Filed May 12, 1978, Ser. No. 905,185
Int. Cl.[2] H03G 3/20
U.S. Cl. 330—284 **15 Claims**



1. An amplifier for composite input signals having a periodically occurring digital component at a given repetition rate and video signals with frequency components substantially different from said repetition rate, said amplifier having an input stage for receiving said input signals, an output stage, means coupled to said output stage for providing a control voltage that is dependent upon the amplitude of said digital component and is independent of the amplitude of said video signals, said input stage comprising an amplifier with a control voltage terminal coupled to receive said control voltage and having a gain and frequency response that varies as a given function of a control voltage applied to said terminal throughout the frequency range of said video signals and digital component.

4,220,932

BUFFER AMPLIFIER

Christopher M. Engel, Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

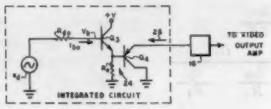
Filed Nov. 3, 1978, Ser. No. 957,637
Int. Cl.[2] H03F 3/18
U.S. Cl. 330—289 **7 Claims**

1. In an integrated circuit, a buffer amplifier for coupling the output of a signal processing circuit to an output pin on the integrated circuit, which output pin is adapted to be coupled to a driven circuit feeding current toward the output pin, the buffer amplifier comprising:

an NPN transistor internal to the integrated circuit having a base electrode and an emitter electrode, said base electrode receiving the output of the signal processing circuit;

a resistor internal to the integrated circuit and coupled between the emitter electrode of said NPN transistor and ground, and

a vertical PNP transistor internal to the integrated circuit



and having a base electrode, an emitter electrode, and a grounded collector electrode, the base electrode of said PNP transistor being connected to the emitter electrode of said NPN transistor, and the emitter electrode of said PNP transistor being connected to the output pin,

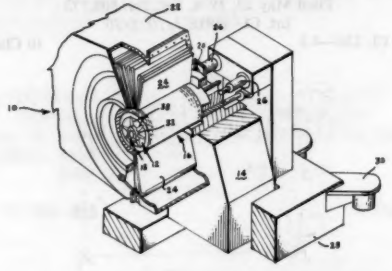
whereby the use of a current-sinking resistor external to the integrated circuit, and the attendant mismatch between the temperature coefficient of an external resistor and the temperature coefficients of circuit elements internal to the integrated circuit, are eliminated.

4,220,933

BAFFLE/NOZZLE ARRAY FOR CYLINDRICAL LASERS

Ralph F. Kuhn, Jr., Calabasas, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 20, 1978, Ser. No. 926,471
Int. Cl.[2] H01S 3/02
U.S. Cl. 331—94.5 D **10 Claims**



1. In a cylindrical laser having an elongated, cylindrically-shaped injector centerbody manifold made of a plurality of modules secured in the axial direction to one another, the improvement therein being in the form of at least one baffle/-nozzle array operably attached to each of said modules, said baffle/nozzle array comprising a circumferential nozzle assembly and a plurality of baffles operably connected in the radial direction between said module and said nozzle assembly, said nozzle assembly being formed of a plurality of nozzle blades, each of said nozzle blades encompassing said module in a hoop-like fashion, each of said baffles being made of two parts, each of said parts being made of a material having a predetermined amount of flexibility, flow channels being formed within

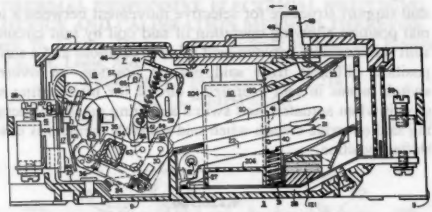
said two parts of said baffles and said flow channels interconnecting the center of said module to said nozzle blades whereby said baffles act as a flexure allowing for differential thermal growth to take place between said nozzle blades and said centerbody of said laser.

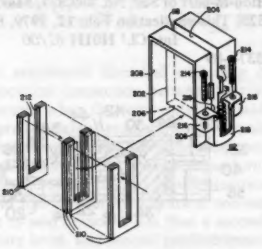
4,220,934

CURRENT LIMITING CIRCUIT BREAKER WITH INTEGRAL MAGNETIC DRIVE DEVICE HOUSING AND CONTACT ARM STOP

John A. Wafer, Brighton Township, Beaver County; Robert H. Hill, S. Beaver Township, Beaver County, and William I. Stephenson, Jr., Brighton Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 952,036
Int. Cl.[2] H01H *77/10*
U.S. Cl. 335—16 **6 Claims**





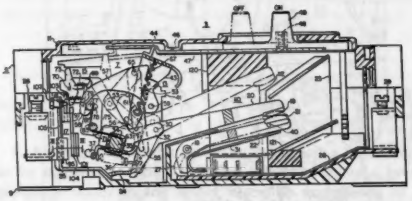
1. Current limiting circuit interrupter apparatus, comprising:
a case;
separable contacts disposed in said case;
a movable contact arm supporting one of said contacts;
an operating mechanism connected to said movable contact arm for operating said movable contact arm between open and closed positions during conditions of normal current flow through said apparatus; and
a slotted magnetic drive device for generating electrodynamic opening force on said movable contact arm, comprising an insulating housing and a stack of U-shaped laminations of magnetic material each having a pair of legs connected by a bight portion;
said housing comprising a pair of spaced parallel insulating side walls parallel to the plane of movement of said contact arm and disposed on either side thereof, and a plurality of resilient retaining walls parallel to said laminations perpendicular to said side walls and outwardly extending at each end therefrom, the distance between said retaining walls being slightly less than the thickness of said lamination stack;
said lamination stack being press fitted into said housing between said retaining walls and positioned with respect to said housing such that said laminations are parallel to the retaining walls, said side walls are between the legs of each of said laminations, and said retaining walls are flexed to produce a force compressing said lamination stick.

4,220,935

CURRENT LIMITING CIRCUIT BREAKER WITH HIGH SPEED MAGNETIC TRIP DEVICE

John A. Wafer, Beaver, and William E. Beatty, Jr., S. Beaver Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 16, 1978, Ser. No. 952,035
Int. Cl.[2] H01H *75/10, 73/36*
U.S. Cl. 335—38 **6 Claims**



1. A current limiting circuit breaker comprising:
separable contacts;
conductive means adapted to connect said contacts to an external circuit being protected;
an operating mechanism releasable to effect automatic separation of said contacts; and
an electromagnetic trip device operable upon overcurrent conditions to release said operating mechanism and separate said contacts, said device comprising a U-shaped pole piece having a bight portion and two leg portions disposed about said conductive means, and a movable laminated armature mechanically coupled to said operating mechanism and magnetically coupled to said pole piece, said leg portions extending from said bight portion in a direction perpendicular to said conductive means and said armature, the width of said armature being not less than the distance between said leg portions and the thickness of said armature being substantially greater than the thickness of said pole piece whereby magnetic attractive force is produced between said pole piece and said armature which increases with increasing current flow up to the point at which said pole piece saturates, and whereby additional magnetic attractive force above said saturation point is produced between said conductive means and the laminations of said armature.

4,220,936

MANUALLY OPERATED GENERATOR CIRCUIT BREAKER

David B. Powell, Burlington, Conn., assignor to General Electric Company, New York, N.Y.

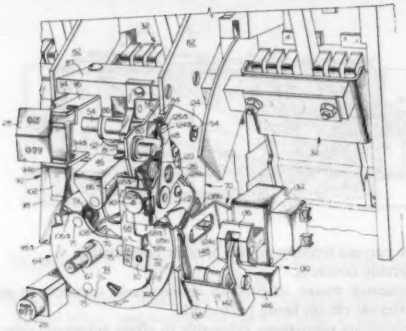
Filed Apr. 6, 1979, Ser. No. 27,556
Int. Cl.[3] H01H *9/20*
U.S. Cl. 335—166 **12 Claims**

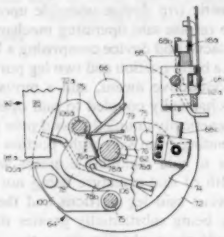
1. An industrial molded case circuit breaker comprising, in combination:
A. a rotary operating handle;
B. a spring powered breaker contact operating mechanism capable of assuming a discharged condition, a charged condition, and a contact closed condition;
C. a charging mechanism to which said handle is drivingly coupled;
D. a reset operator mounted for movement between a discharged position, a charged position and a contact closed position, said reset operator coupled with said operating mechanism for movement thereby from its charged position to its contact closed position to its discharged position

as said operating mechanism goes from its charged condition to its contact closed condition to its discharged condition, said reset operator being engaged by said charging mechanism during a charging cycle for motivation by said handle from its discharged position to its charged position to in turn forcibly drive said operating mechanism from its discharged condition to its charged condition;

E. a hook engagably actuated by said reset operator while approaching its charged position near the conclusion of a charging cycle to latchably engage and detain said operating mechanism in its charged condition and said reset operator in its charged position;

F. a closing mechanism operable to articulate said hook out





of engagement with said operating mechanism, whereby said operating mechanism springs from its charged condition to its contact closed condition and said reset operator is moved from its charged position to its contact closed position; and

G. means included in said charging mechanism and engagably actuated by said reset operator in both its charged and contact closed positions to automatically decouple said handle from said charging mechanism, upon tripping of said operating mechanism to convert same from its contact closed condition to its discharged condition, said reset operator, in assuming its discharged position, disengages said automatic decoupling means to permit recoupling of said handle with said charging mechanism.

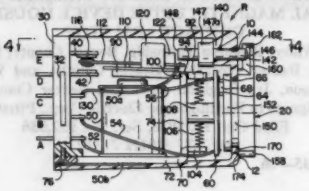
4,220,937

ELECTROMECHANICAL RELAY WITH MANUAL OVERRIDE CONTROL

Donald R. Ritzenthaler, Reedsburg, Wis., assignor to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,206
Int. Cl.[2] H01H *45/02, 45/04*
U.S. Cl. 335—186 **13 Claims**

1. In a relay comprising an energizable operating coil, a circuit on said relay for directing energizing current through said coil, an armature member controlled by said coil and movable into a first actuated position when said coil is energized and into a second released position when said coil is not energized, at least one pair of contacts movable into a first relative position when said armature member is in its first actuated position and into a second relative position when said armature is in its second released position, the improvement comprising: a support structure on said relay; a manually shiftable member; means for mounting said shiftable member on



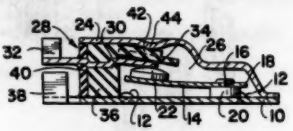
said support structure for selective movement between a normal position allowing operation of said coil by said circuit to shift said contacts between said relative positions and a shifted position different from said normal position; an override switch means in said energizing circuit for interrupting said circuit when actuated; and switch actuating means for actuating said override switch when said shiftable member is in said shifted position.

4,220,938

THERMOSTATIC ELECTRICAL SWITCH

Jack W. Grable, Dayton, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 882,877, Mar. 2, 1978, Pat. No. 4,157,525. This application Feb. 12, 1979, Ser. No. 11,326
Int. Cl.[2] H01H *61/00*
U.S. Cl. 337—89 **11 Claims**



1. A thermostatic electrical switch for providing an electrically conductive path when the temperature of the switch is below a threshold temperature and for opening said path when the temperature of the switch is above said threshold temperature, comprising:

a conductive base plate,

a bimetal thermostatic snap element which is generally concave upwardly when its temperature is less than said threshold temperature and which snaps to a straightened position when its temperature is above said threshold temperature, said snap element defining a rivet receiving opening in a first end thereof,

rivet means, extending through said rivet receiving opening in said snap element and riveted thereto, for mounting said snap element on the top of said base plate and connecting electrically said base plate and said snap element, said rivet means being welded to said base plate,

an electrical snap contact mounted on the upper surface of said snap element adjacent a second end of said snap element, opposite said first end, and electrically connected to said snap element,

a conductive cap covering said snap element and welded to said base plate around a portion of the periphery of said cap, thereby forming a casing with said base plate, said casing defining a casing cavity in which is positioned said

snap element and further defining an opening communicating with said cavity,

an electrically conductive terminal having a connector at a first end and a terminal contact at a second end thereof, and

mounting means in said opening for mounting said terminal such that said terminal extends through said opening with said terminal contact in contact with said snap contact when the temperature of said snap element is less than said threshold temperature,

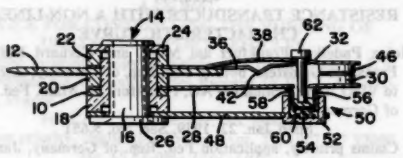
whereby an electrical path is provided from said casing to said conductive terminal via said snap element and said snap contact until the temperature of said switch exceeds said threshold temperature, at which time said snap element snaps to a straightened position, breaking the conductive path between said terminal contact and said snap contact.

4,220,939

THERMAL RESPONSIVE ELECTRICAL SWITCHING DEVICE AND CALIBRATION METHOD THEREFOR

Jack W. Grable, Dayton, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 12, 1979, Ser. No. 11,214
Int. Cl.² H01H *61/08*
U.S. Cl. 337—94 **7 Claims**



1. A thermal responsive electrical switching device for providing an electrical connection between first and second electrical connectors when the temperature of said device is less than a first predetermined temperature level and for terminating said electrical connection when the temperature of said device exceeds said first predetermined temperature level, said switching device thereafter re-establishing electrical connection between said first and second electrical connectors when the temperature of said device is less than a second predetermined temperature level, said second predetermined temperature level being less than said first predetermined temperature level, comprising:

non-conductive mounting means,

movable contact means, mounted on said non-conductive mounting means, and electrically connected to said first electrical connector,

bistable snap contact means, mounted on said non-conductive mounting means, and electrically connected to said second electrical connector, said bistable snap contact means having a first snap position in which it is biased into electrical contact with said movable contact means to provide said electrical connection between said first and second electrical connectors and a second snap position in which it is biased out of electrical contact with said movable contact means to terminate said electrical connection between said first and second electrical connectors,

thermal responsive bimetal means, mounted on said non-conductive mounting means on the side of said movable contact means opposite said bistable snap contact means, for deflecting toward said movable contact means in response to an increase in the temperature of said device, and

actuator means, mounted on said bimetal means, including a first actuator for contacting said movable contact means as said bimetal means is deflected toward said movable contact means to cause said bistable contact means to snap into said second snap position, and a second actuator for contacting said bistable contact means as said bimetal means is deflected away from said movable contact means to cause said bistable contact means to snap into said first snap position.

4,220,940

SPIDER ASSEMBLY FOR A HIGH VOLTAGE FUSE

William J. Huber, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Oct. 5, 1978, Ser. No. 948,909
Int. Cl.² H01H *85/16*
U.S. Cl. 337—231 **10 Claims**

1. An improved spider assembly to support a fusable ribbon to be mounted within a housing which contains a granular dielectric material, the spider assembly comprising at least three plates having support surfaces along their longitudinal edges, each support surface on each plate being offset with respect to each other and with respect to the support surfaces on the other plates, each plate including at least one longitudinal slot intermediate the longitudinal edges of the plates whereby the plates can be cross fitted into each other with the plates being angularly related so that the support surfaces define a helical path for the fusable ribbon.

4,220,941

HIGH CONTINUOUS CURRENT CAPACITY OIL EXPULSION FUSE HAVING MULTIPLE, UNIDIRECTIONALLY VENTED, SEALED BORES

William R. Mahieu, and Charles A. Popeck, both of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Oct. 13, 1978, Ser. No. 951,108
Int. Cl.² H01H *85/14, 85/02*
U.S. Cl. 337—250 **15 Claims**

1. An expulsion fuse adapted for oil immersion and operable to interrupt low range fault and overload currents in a high voltage electrical distribution circuit, said fuse comprising:

a pair of spaced, electrically conductive terminals adapted to be interposed in said circuit;

an elongated dielectric member spanning the distance between said terminals;

structure defining multiple, discrete bores in said member and extending the full length thereof,

said bores being vented at each end of said member to establish a fluid flow path through each bore;

a conductive element disposed within each of said bores and electrically coupled to said terminals for defining a plurality of electrically parallel current paths therebetween,

said elements each including a fusible segment, meltable upon experiencing a current of a predetermined level, for the breaking of said electrical circuit by melting of said segments when the segments are subjected to a fault current above said predetermined level with consequent arc generation and vaporization of said oil; and

means for directing at least a portion of the gases derived from said oil vaporization through the at least certain of said bores for clearing the same of conductive material.

4,220,942

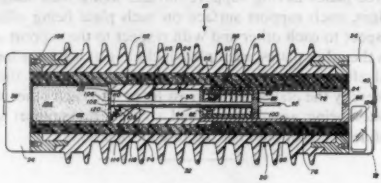
CIRCUIT INTERRUPTING DEVICE

Otto Meister, Arlington Heights, and Thomas J. Tobin, Northbrook, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed May 24, 1978, Ser. No. 909,144

Int. Cl.³ H01H *85/40*

U.S. Cl. 337—277 **69 Claims**



69. An improved circuit interrupting device of the type in which a first contact and a second contact move relatively apart following the melting of a fusible element, and in which a flow of dielectric fluid is directed at an elongating arc established between the parting contacts; wherein the improvement comprises:

diaphragm means for normally preventing the flow of the fluid; and

means for shunting away from the diaphragm means current flowing through the device as long as the fusible element is unmelted, and for directing such current through the diaphragm means to melt the diaphragm means after the fusible element melts.

4,220,943

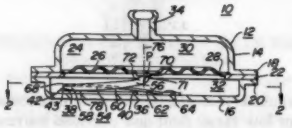
SIGNAL TRANSDUCING APPARATUS

Laurence N. Wesson, Collegeville, Pa., and Carl J. Durkow, Runnemede, N.J., assignors to TRW, Inc., Cleveland, Ohio

Filed Dec. 26, 1978, Ser. No. 972,864

Int. Cl.² H01L *10/10*

U.S. Cl. 338—42 **20 Claims**



1. A signal transducing apparatus comprising first and second elements movable with respect to each other and each having first and second ends and a conductive path, the conductive paths of the elements electrically contacting each other at a location which is displaced along their paths with the relative movement of the elements, a spring unit for movably retaining the second element having a first end fixed with respect to the first element and a second end secured with the second end of the second element, the spring unit urging the second end of the second element in a predetermined direction with respect to the first element and urging the first end of the second element in the direction toward the first element, actuating means positioning the second element with respect to the first element by moving the second end of the second element in a direction opposite to the direction in which it is urged by said spring unit, and connecting means electrically joined with the conductive paths of the first and second elements for providing an output signal determined by the position of one element with respect to the other.

4,220,944

RESISTANCE TRANSDUCER WITH A NON-LINEAR CHARACTERISTIC CURVE

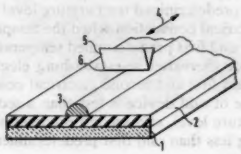
Heinz Pudelko, Frankfurt am Main, and Gerhard Kallweit, Frankfurt-Goldstein, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,651

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802857

Int. Cl.² H01C *10/38*

U.S. Cl. 338—176 **7 Claims**



1. A resistance transducer with a non-linear characteristic curve having a resistance track with variable cross-section on an insulating carrier and a slider operatively engaging on the resistance track, comprising

an insulating carrier,

a resistance track of a thick layer system on said insulating carrier,

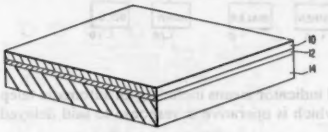
at least one additional layer applied on said resistance track in the same technology made of a conducting resistance material formed such that the additional layer forms a rib which extends in the direction of movement of the slider, the rib tapering rounding off perpendicular thereto outwardly, and

a slider formed V-shaped in cross-section, said slider and said rib tapering substantially in directions toward each other, said slider having an elongated edge at a narrowest portion of its V-shape, said edge being oriented relative to said rib forming an approximately point-like engagement surface transversely engaging said rib, said rib and said edge of said slider extend substantially perpendicularly to each other such that a point-like contact of said slider and said rib occur.

4,220,945
PRINTED CIRCUIT SUBSTRATE WITH RESISTANCE COAT

Takeshi Kakuhashi, and Yasufumi Miyake, both of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Filed Mar. 7, 1978, Ser. No. 884,296
Claims priority, application Japan, Nov. 21, 1977, 52-140525
Int. Cl.[2] H01C 7/18
U.S. Cl. 338—308 7 Claims

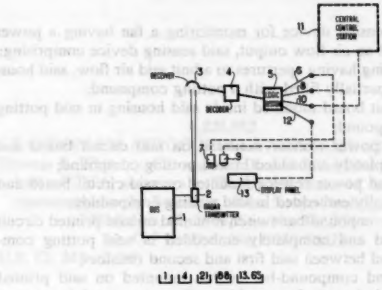


1. A printed circuit substrate with a resistance coat, comprising an insulating support having provided at least on one side thereof a plated resistance coat of a tin-nickel alloy consisting essentially of about 50–85% by weight tin and about 15–50% by weight nickel, and further comprising a highly conductive material layer disposed over said resistance coat.

4,220,946
DEVICE FOR CONTROLLING THE RUNNING OF URBAN TRANSPORT VEHICLES

Christophe Henriot, Crepy en Valois, France, assignor to L'Electronique des Vehicules et des Reseaux (E.V.R.), Aubervilliers, France

Filed Apr. 20, 1978, Ser. No. 898,249
Claims priority, application France, Apr. 21, 1977, 77 12000
Int. Cl.[2] G08G 1/12, 1/07
U.S. Cl. 340—23 5 Claims



1. A system for monitoring the travel of urban public transport vehicles over a route having several stops, said system comprising data transmission units disposed on each vehicle and a plurality of recording and signalling ground beacons spaced out along the route of the vehicles for receiving and processing data transmitted by said transmission units, each of said transmission units comprising:

first display means for storing the identification of the vehicle, its route and the optimum time for the next vehicle to pass,

a first clock for measuring the real travel time of the vehicle since its departure from the terminus of the route, and

encoding and transmitting means connected to said display means and said first clock for transmitting an encoded data signal representing the identification of the vehicle, its route, the optimum time for the next vehicle to pass and the real travel time of the vehicle,

each of said recording and signalling ground beacons comprising:

receiving and decoding means for receiving said encoded data signal and providing output signals representative of the identification of the vehicle, its route, the optimum time for the next vehicle to pass and the real travel time of the vehicle,

recording means for storing data representing the theoretical travel time for the identified vehicle and its route,

a second clock for supplying clock pulses,

a first counter connected to said recording means and preset to said theoretical travel time,

a second counter connected to said receiving and decoding means and preset to said optimum time for the next vehicle to pass,

a third counter connected to said receiving and decoding means and preset to said real travel time,

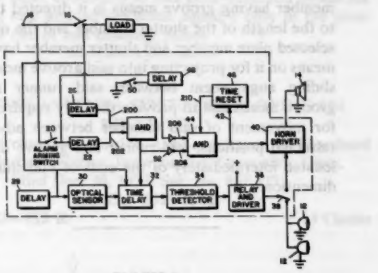
gating means connected to said second clock for supplying clock pulses to said first, second and third counters so that said first counter counts up while said second counter counts down to zero and then counts down while said third counter counts down to zero, the count remaining on said first counter when said third counter counts to zero indicating the waiting time for the next bus, and

second display means connected to said first counter for displaying the waiting time for the next vehicle.

4,220,947
HEADLAMP AND SECURITY ALARM CONTROL SYSTEM

Yujiro Yamamoto, 1880 Park Newport, Newport Beach, Calif. 92660

Filed Aug. 10, 1978, Ser. No. 932,467
Int. Cl.[3] B60R 25/10; B60Q 1/08
U.S. Cl. 340—63 17 Claims



1. A headlamp controller for vehicles having headlamps, a headlamp switch, an ignition switch, and an electrical power source, which controller comprises:

switch means responsive to a switching signal for permitting and preventing electrical power flow to said headlamps;

switching signal generating means in the form of a time delay circuit operative when in a first state to cause said switch means to permit, and when in a second state to prevent power flow to said headlamps;

state control means in the form of a light sensor, when electrically conductive, for permitting said time delay means to change at one rate from said first to said second state and, when non-conductive, to change from said first state to said second state at a slower rate; and

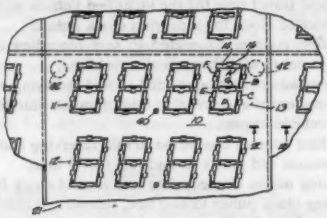
maintaining means for maintaining said light sensor energized for a selected period after actuation of said ignition switch.

4,220,948

NON-ELECTRONIC CHARACTER DISPLAY

Charles E. Trame, Mequon, Wis., assignor to Everbrite Electric Signs, Inc., South Milwaukee, Wis.

Filed Oct. 12, 1978, Ser. No. 950,920
Int. Cl.[2] G08B *5/02*
U.S. Cl. 340—378.2 **13 Claims**



1. A character display device comprising:

an opaque front plate member having front and rear faces and having groups of elongated openings arranged as segments for being selectively opened and closed to delineate a character,

a back plate member having front and rear faces and having its front face in interfacing spaced relationship with the rear face of said front plate,

a shutter member disposed in the space adjacent the respective openings for being moved manually between a retracted position in which it opens said opening and an advanced position in which it closes said opening,

each shutter member having its length dimension extending correspondingly with the length of said elongated openings and having a width dimension less than its length, said member being movable in the direction of its width dimension,

one of a selected one of said plate members and a shutter member having groove means in it directed transversely to the length of the shutter member and the other of said selected plate member and shutter member having runner means on it for projecting into said groove means to effect sliding engagement between said runner means and groove means and to provide the only required guidance for movement of said member between advanced and retracted positions, said runner and groove means being located intermediately of the ends of said shutter length dimension.

4,220,949

ELECTRIC FENCE MONITOR AND ALARM APPARATUS AND METHOD

George F. Pope, and Evelyn O. Childress, both of Burlington, N.C., assignors to Diversified Manufacturing & Marketing Co., Inc., Burlington, N.C.

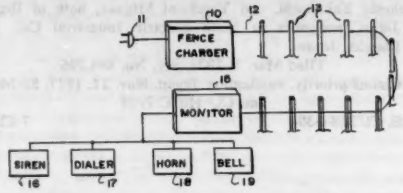
Filed May 3, 1978, Ser. No. 902,526
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—533 **14 Claims**

1. Apparatus for monitoring the condition of a charged pulsating high voltage fence, comprising:

means for detecting the charge on the fence being monitored and providing a signal in response to the charge falling below a pre-determined level, said detecting means including a voltage breakdown device;

means for delaying said signal thereby delaying the indication of the charge on the fence falling below a pre-determined level;

means for delaying said signal thereby delaying the indication of the charge on the fence falling below a pre-determined level; and



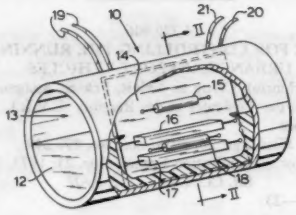
said indicator means including an automatic telephone dialer which is operative in response to said delayed signal.

4,220,950

AIR FLOW SENSOR

Scott A. Clark, and William E. Ulmer, both of Cedar Rapids, Iowa, assignors to S. A. Clark & Associates, Marion, Iowa

Filed Dec. 29, 1978, Ser. No. 974,214
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—594 **2 Claims**



2. A sensing device for monitoring a fan having a power input and an air flow output, said sensing device comprising:

a housing having apertures to admit said air flow, said housing partially filled with a potting compound;

a circuit board mounted inside said housing in said potting compound;

a first power resistor mounted on said circuit board and completely embedded in said potting compound;

a second power resistor mounted on said circuit board and partially embedded in said potting compound;

a first compound-bar switch mounted on said printed circuit board and completely embedded in said potting compound between said first and second resistors;

a second compound-bar switch mounted on said printed circuit board above said potting compound in contact with said air flow;

said first and second resistors connected in parallel to each other and in series with said power input and said fan;

said first and second compound-bar switches each connected to an alarm means,

such that a change in state of either switch activates said alarm means.

4,220,951

METHOD AND SYSTEM FOR PROTECTING BARGE

Leroy A. Bash, Houston; Raymond B. Cherry, Dickinson; Robert M. Speck, Richmond, and William N. McDuffie, Rosenberg, all of Tex., assignors to Cathodic Protection Services, Inc., Houston, Tex.

Filed Sep. 28, 1978, Ser. No. 946,901
Int. Cl.[2] G01R *31/02*
U.S. Cl. 340—649 **8 Claims**

1. A method for electrically grounding a metallic object and

an adjacent metallic structure with a grounding network which forms an integral part with a grounding continuity monitoring system that continuously senses the effectiveness of the grounding network, thereby ensuring safe operating conditions, comprising:

electrically connecting the structure to the earth through a first grounding means;

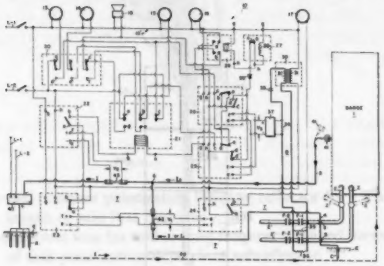
electrically connecting the object to said structure and to the earth through a second grounding means, whereby a grounding circuit is established between said grounding means, said structure and said object including the electrolytic path extending through said structure;

applying an electric current to said first and second means;

sensing the amplitudes of the currents flowing in said first and second means;

electrically connecting an alarm circuit to said grounding network, said alarm circuit including suitably interconnected switching means, relays and warning devices; and

selectively energizing said warning devices in dependence upon the amplitudes of the sensed currents.

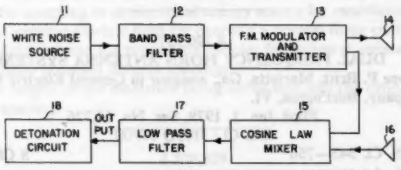


4,220,952

RANDOM FM AUTOCORRELATION FUZE SYSTEM

Thomas B. Whiteley, Corona, and Donald J. Adrian, Arlington, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 17, 1956, Ser. No. 566,318
Int. Cl.[3] F42C *13/04*; G01S *13/34*
U.S. Cl. 343—7 PF 5 Claims



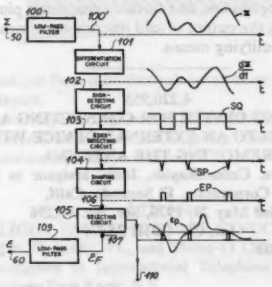
1. An FM doppler fuze system comprising means for transmitting a signal having a carrier frequency modulated by a band of random noise, means for mixing the transmitted signal with a return echo signal modified by the doppler effect of the relative movement between the fuze and a target, and means for deriving an output adapted to actuate the fuze from the low frequency doppler portion of the output from said mixing means.

4,220,953

CIRCUIT ARRANGEMENT FOR IMPROVING ACCURACY OF ANGULAR MEASUREMENTS IN RADAR SYSTEMS

Roland Carre, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 26, 1978, Ser. No. 918,791
Claims priority, application France, Jun. 27, 1977, 77 19617
Int. Cl.[2] G01S *9/22*
U.S. Cl. 343—16 M 7 Claims



1. A circuit arrangement for improving the accuracy of angular measurements in a radar system with a first reception channel emitting a sum signal Σ, a second reception channel emitting a difference signal Δ, and circuitry connected to said reception channels for deriving therefrom an angular-deviation signal ε appearing on an output thereof, comprising:

peak-detection means connected to said first reception channel for generating a succession of enabling pulses each coinciding with a period close to an instant at which the slope of said sum signal Σ changes from positive to negative values; and

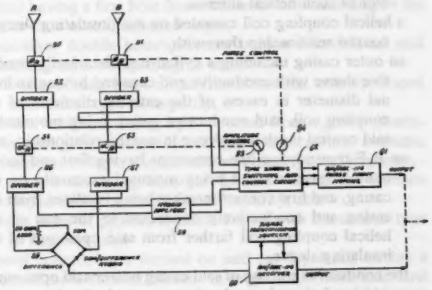
gating means connected to said output and provided with a control input connected to said peak-detection means for passing said angular-deviation signal ε only in the presence of one of said enabling pulses.

4,220,954

ADAPTIVE ANTENNA SYSTEM EMPLOYING FM RECEIVER

Nathan Marchand, Greenwich, Conn., assignor to Marchand Electronic Laboratories, Incorporated, Greenwich, Conn.

Filed Dec. 20, 1977, Ser. No. 862,373
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—113 R 13 Claims



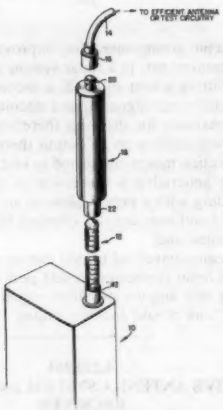
1. In a system responsive to the direction of propagation of a radiation of radio waves bearing a pair of spaced apart antennas are provided for receiving said radiation; the improvement comprising frequency modulation discriminator means, means

alternately coupling signals received by said antennas to said discriminator means, an output circuit, synchronous rectifying means coupling the output of said discriminator means to said output circuit, said synchronous rectifying means being synchronized with said antenna coupling means, a sum-difference hybrid, means applying the signals received by said antenna to said sum-difference hybrid, including phase shift means connecting at least one of said antennas to said sum-difference hybrid, means controlling the phase shift of said phase shifting means with the signals of said output circuit, whereby the sum and difference outputs of said hybrid are responsive to said direction of propagation, and further comprising phase shifter means coupling the output of said discriminator means to said synchronous rectifying means.

4,220,955
RF COUPLING DEVICE FOR CONNECTING A HAND HELD RADIO TO AN EXTERNAL DEVICE WITHOUT REMOVING THE ANTENNA

Eugene O. Frye, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 29, 1979, Ser. No. 43,296
Int. Cl.[2] G01R *25/04*
U.S. Cl. 343—703 **16 Claims**



1. A coupling device providing R-F energy coupling to a compact helical antenna in the absence of fixed mechanical coupling thereto, comprising:

a central cylindrical insulating sleeve open at one end and having an internal diameter in excess of the external diameter of such helical antenna,

a helical coupling coil mounted on said insulating sleeve in coaxial relationship therewith,

an outer casing including a cylindrical electrically conductive sleeve with conductive end caps and having an internal diameter in excess of the external diameter of said coupling coil, said conductive casing being mounted on said central insulating sleeve in coaxial relationship, and

an R-F transmission line connector having first and second contact members and being mounted externally on said casing, and first contact member being insulated from said casing and conductively connected to the end of said helical coupling coil farther from said open end of said insulating sleeve,

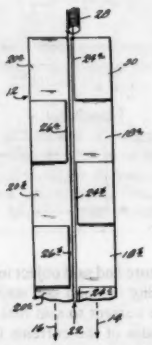
the conductive end cap of said casing nearer said open end of said insulating sleeve having a central circular aperture therein having a diameter in excess of the outside diameter of said insulating sleeve,

whereby mere placement of said antenna coupling device over such helical antenna in coaxial telescoping relationship effects inductive coupling of R-F energy between said coupling device and such antenna.

4,220,956
COLLINEAR SERIES-FED RADIO FREQUENCY ANTENNA ARRAY

Gary G. Sanford, Boulder, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 6, 1978, Ser. No. 957,681
Int. Cl.[3] H01Q *1/28, 11/02*
U.S. Cl. 343—706 **27 Claims**



1. A collinear series-fed array of radio frequency transmitting/receiving elements, said array comprising:

a first series of enlarged electrically conductive areas spaced apart and serially interconnected by relatively smaller electrical conductive strips,

a second series of enlarged electrically conductive areas spaced apart and serially interconnected by relatively smaller electrically conductive strips,

said first and second series being spaced apart but disposed symmetrically and in close proximity along their length and with the enlarged areas of the first series being disposed opposite the smaller strips of the second series whereby a collinear array of transmitting/receiving elements are defined by apertures between the two series,

said first and second series being disposed, in operation, substantially apart and away from other electrically conductive surfaces whereby a substantially omnidirectional radiation pattern is achieved due to said symmetrical disposition defining said collinear array of transmitting-/receiving elements, and

one end of both said first and second series being adapted for electrical connection to send/receive radio frequency energy to/from said array of elements.

4,220,957
DUAL FREQUENCY HORN ANTENNA SYSTEM

Pope P. Britt, Marietta, Ga., assignor to General Electric Company, Burlington, Vt.

Filed Jun. 1, 1979, Ser. No. 44,726
Int. Cl.[2] H01Q *19/00*
U.S. Cl. 343—756 **8 Claims**

1. An antenna system comprising:

a feedhorn system providing

a first, relatively low frequency wavefront of energy which is polarized in a first direction, and

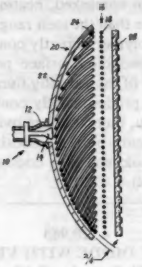
a second, relatively high frequency wavefront of energy which is polarized in a second direction at 90° to said first direction;

a polarization dependent subreflector for said first frequency spaced forward of said feedhorn system;

a concave polarization twisting reflector for said first

frequency spaced aft of said polarization dependent subreflector;

a concave polarization reversing reflector spaced aft of



said concave polarization twisting reflector by ¼ wavelength of said first frequency; and

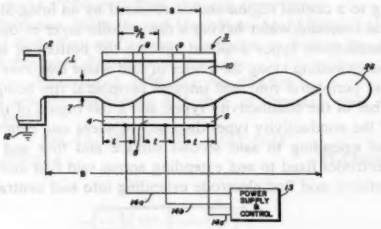
a dielectric lens for said second frequency spaced forward of said polarization dependent subreflector.

4,220,958

INK JET ELECTROHYDRODYNAMIC EXCITER

Joseph M. Crowley, Champaign, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 21, 1978, Ser. No. 972,099
Int. Cl.² G01D *15/18*
U.S. Cl. 346—75 **34 Claims**



1. An electrohydrodynamic exciter for promoting the formation of droplets at substantially constant spacings from a column of electrically conductive fluid emitted under pressure from a nozzle comprising

a pump electrode adjacent the fluid column including means for coupling to an electrical energy source for establishing a varying electric field for exerting a normal force on the fluid column for promoting droplet formation at substantially constant droplet spacings

the length of the electrode being about one half the droplet spacing.

4,220,959

JOSEPHSON TUNNEL JUNCTION WITH POLYCRYSTALLINE SILICON, GERMANIUM OR SILICON-GERMANIUM ALLOY TUNNELING BARRIER

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

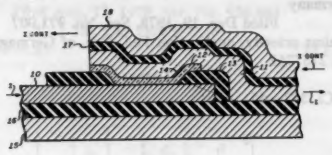
Filed Mar. 23, 1979, Ser. No. 23,487
Int. Cl.² H01L *39/22*
U.S. Cl. 357—5 **27 Claims**

1. A Josephson tunnel junction device comprising

first and second layers of superconductive material superposed with respect to each other,

at least said first layer comprising a refractory compound superconductive material, and

a barrier layer superposed between said first and second superconductive layers whereby Josephson tunnelling



current can flow therethrough between said superconductive layers,

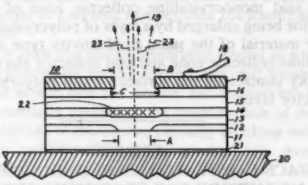
said barrier layer comprised of polycrystalline semiconductor material selected from the group consisting of silicon, germanium and alloys thereof.

4,220,960

LIGHT EMITTING DIODE STRUCTURE

Yet-Zen Liu, Roanoke, Va., and Shang-Yi Chiang, Richardson, Tex., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 25, 1978, Ser. No. 954,703
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 **5 Claims**



1. A small-area light-emitting diode structure of the surface-emitting type having a plurality of epitaxial semiconductor layers comprising in combination:

a substrate layer of gallium arsenide doped with a first type of impurity;

a metallic support means bonded to one face of said substrate layer;

a blocking layer of gallium arsenide doped with a second type of impurity opposite the first type of impurity forming a pn junction on the other face of said substrate, said blocking layer having a first hole formed therein and extending to the other face of said substrate layer;

a four-layer double heterojunction structure formed on said blocking layer comprising, in order,

a first confining layer of gallium aluminum arsenide doped with a first type of impurity,

an active light-emitting layer selected from a group consisting of gallium arsenide and gallium aluminum arsenide, said active layer doped with a second type of impurity,

a second confining layer of gallium aluminum arsenide doped with a second type of impurity, and

a cap layer of gallium arsenide doped with the second type of impurity; and

a metal contact layer formed on said cap layer and having a second hole formed therein in registration with said first hole on an axis perpendicular to the planes of said layers, said second hole having a size approximately equal to the size of the first hole, whereby radiant light output is emitted through said second hole when a dc voltage of proper polarity is impressed between the metallic supporting means and the metal contact layer.

4,220,961

MONOLITHIC COMBINATION OF TWO COMPLEMENTARY BIPOLAR TRANSISTORS

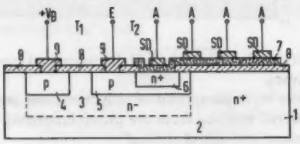
Wolfgang Werner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 971,007

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757762

Int. Cl.[2] H01L 27/02

U.S. Cl. 357—46 13 Claims



1. A monolithic combination of two complementary bipolar transistors of which one is formed as a lateral transistor, and the other as a vertical transistor, next to one another on the surface of a semiconductor monocrystal and designed in such a manner that the base zone of the vertical transistor coincides with the collector zone of the lateral transistor, in which, at least one collector zone of said vertical transistor marked off from the base zone of said vertical transistor by means of a pn-junction and a Schottky contact forming a collector electrode, said monocrystalline collector zone of said vertical transistor being enlarged by a layer of polycrystalline semiconductor material of the same conductivity type as said monocrystalline collector zone and said collector electrode being a Schottky contact on the surface of said polycrystalline semiconductor layer.

4,220,962

SURFACE PASSIVATED SEMICONDUCTOR DEVICE AND METHOD FOR PRODUCING THE SAME

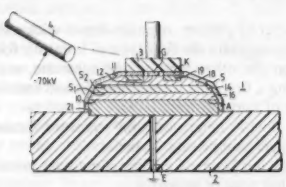
Karlheinz Sommer, and Werner Köhler, both of Warstein, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 14, 1978, Ser. No. 915,355

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1977, 2726667

Int. Cl.[2] H01L 29/34; B05D 5/12, 3/02

U.S. Cl. 357—52 11 Claims



1. Surface passivated semiconductor device comprising a semiconductor wafer having a semiconductor surface portion which intersects a pn-junction and an organic passivation layer consisting of a partially fluorinated hydrocarbon polymer which is in contact with and covers said semiconductor surface portion including the intersection of the pn-junction with the semiconductor surface portion, said passivation layer being formed as a continuous coating which is produced by applying directly to the semiconductor surface portion a powder of said polymer which contains predominantly particles of grain size less than 30μ, said powder being melted and then solidified to form the continuous coating.

5. Method for producing a surface passivated semiconductor from a silicon semiconductor device which has been provided with a semiconductor surface portion which intersects a pn-junction and with electrodes and which has been prepared by grinding and etching its semiconductor surface comprising: covering the electrodes with a mask and leaving the semiconductor surface portion unmasked, heating the semiconductor device to slightly more than the melt range of a partially fluorinated hydrocarbon polymer, directly contacting and covering the unmasked semiconductor surface portion of the heated device with a powder of the partially fluorinated hydrocarbon polymer, the powder predominantly containing particles of a grain size less than 30μ, thereafter removing the mask, heating the coating for final cure until a smooth coating is obtained after removing the mask, and then cooling the resulting coating to room temperature.

4,220,963

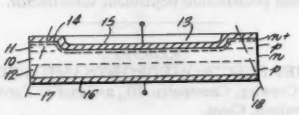
FAST RECOVERY DIODE WITH VERY THIN BASE

Vladimir Rumennik, El Segundo, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 14, 1978, Ser. No. 960,592

Int. Cl.[3] H01L 29/06

U.S. Cl. 357—55 7 Claims



1. A large area fast recovery diode comprising a wafer of monocrystalline silicon having first and second parallel surfaces and a central well formed in said first surface and extending to a central region and surrounded by an integral peripheral rim; said wafer having a central thin layer of one of the conductivity types disposed beneath the bottom of said well and extending along the center of said wafer and over-lapping said peripheral rim; said integral peripheral rim being of the other of the conductivity types; and a flat region of the other of the conductivity types disposed adjacent said central layer and extending to said second surface and first and second electrodes fixed to and extending across said first and second surfaces; said first electrode extending into said central wall.

4,220,964

SECAM RECORDING AND REPRODUCING SYSTEM

Kazuo Yamagiwa, Tokyo, and Toshihiko Numakura, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1978, Ser. No. 960,839

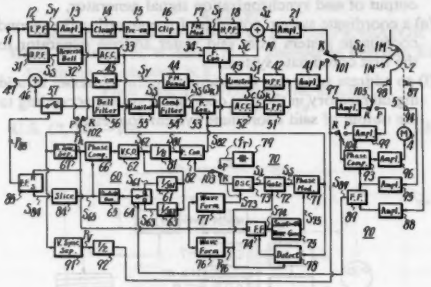
Claims priority, application Japan, Nov. 21, 1977, 52-139623; Dec. 12, 1977, 52-149008; Mar. 30, 1978, 53-37118

Int. Cl.[2] H04N 5/79

U.S. Cl. 358—8 65 Claims

1. In apparatus for recording a SECAM composite color television signal in parallel tracks on a record medium by separating the luminance and chrominance components from said SECAM television signal, modulating said luminance component to a higher frequency range, converting said chrominance component to a lower frequency range, and recording the modulated luminance component and frequency-converted chrominance component, the improvement comprising means for generating first and second frequency-converting carrier signals; phase control means for imparting phase changes into said frequency-converting carrier signals which are related to phase changes in the chrominance subcarrier of the chrominance component in said SECAM television signal; and frequency-converting means supplied with said chrominance component of said SECAM television signal and the phase controlled frequency-converting carrier signals to produce frequency-converted chrominance components for recording

in adjacent tracks having subcarrier phase changes eliminated therefrom in at least one track and having frequency-con-



verted subcarriers in one track which differ from the frequency-converted subcarriers in an adjacent track.

4,220,965

MODIFICATION OF T.V. IMAGE PERFORMED USING RAM STORING THE IMAGE CONTENT

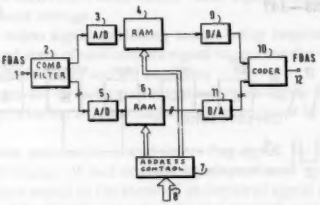
Jürgen Heitmann, Seeiheim, and Hans-Peter Maly, Darmstadt, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,525

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725362

Int. Cl.² H04N 9/535, 3/22, 5/22

U.S. Cl. 358—22 **17 Claims**



1. A method for the processing of color-T.V. signals, comprising the steps of separating a complete analog color-T.V. signal representing a T.V. image into its luminance signal component and its color signal component; converting each of the signal components from analog to digital form; writing each of the digitalized components into a random-access memory using during the write-in a predetermined address sequence, including the step of writing the color signal component into such random-access memory in the form of two sequential signals; reading each of the thusly stored digitalized components out from such random-access memory using during the read-out an address sequence different from the address sequence used during the write-in; converting the read out digitalized components back to analog form, and combining them to form a complete analog color-T.V. signal.

4,220,966

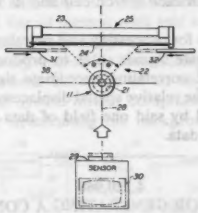
DETERMINING BOUNDARIES OF A TRANSPARENT TUBE

Liber J. Montone, Reading, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,661

Int. Cl.² H04N 7/18

U.S. Cl. 358—101 **10 Claims**



1. A method of determining an inner surface of a hollow cylindrical article, the article being substantially transparent to at least some form of radiating energy, the method comprising:

positioning the article between a diffused source of such radiating energy and a quantitative sensor of such radiating energy;

orienting a longitudinal axis of the article into a first plane perpendicular to a sensing axis between the source and the sensor; and

positioning at least one energy absorbing shutter in a second plane perpendicular to the sensing axis and located between the article and the source, the shutter having an edge substantially parallel to the inner surface of the article, the position of the shutter partially blocking radiation emanating peripherally to the sensing axis from the source, thereby casting a shadow image on the inner surface, said shadow image delineating the position of the inner surface to the sensor.

4,220,967

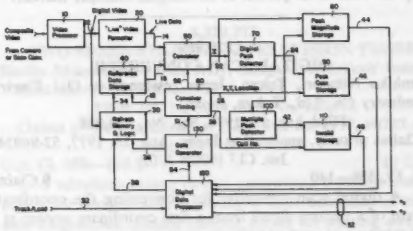
SCENE TRACKER USING MULTIPLE INDEPENDENT CORRELATORS

LeRoy F. Ichida, Canoga Park; Robert A. Sturla, Northridge, and Jacob M. Sacks, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 27, 1976, Ser. No. 727,101

Int. Cl.² H04N 7/18

U.S. Cl. 358—105 **11 Claims**



1. A scene tracker system adapted for responding to sequentially applied fields of data each of which are definitive of a scene within a field of view, so as to provide global correlation coordinate signals which are indicative of the relative spatial displacement between scenes defined by different fields of data, said system comprising:

reference date storage means for storing reference cell data

from a preselected plurality of portions of one field of data;

means for correlating the data for each reference cell against data for an associated search cell, with the data for each associated search cell being derived from a portion of a subsequent field of data which encompasses the relative position of the associated reference cell; and for providing local correlation coordinate signals indicative of the relative location within each search cell of the correlation match between each search cell and its respective reference cell; and

processor means for processing said plurality of local correlation coordinate signals so as to produce as a function thereof global correlation coordinate signals which are indicative of the relative spatial displacement between the scenes defined by said one field of data and said subsequent field of data.

4,220,968

CIRCUIT FOR GENERATING A CONSTANT REFERENCE OSCILLATION FROM A VIDEO SIGNAL AFFECTED BY A TIME ERROR

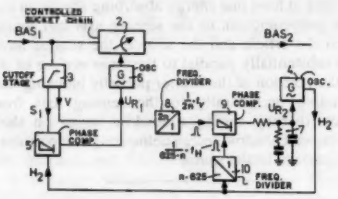
Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Ted Bildplatten Aktiengesellschaft Aeg-Telefunken-Teldec, Switzerland

Filed Sep. 27, 1978, Ser. No. 946,385

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745375

Int. Cl.² H04N 5/795

U.S. Cl. 358—127 **12 Claims**



2. A circuit for generating a substantially constant reference oscillation from a time error affected video signal, specifically for time error compensation with a recording unit, having an oscillator which is synchronized by video signal cutoff sync pulses via a phase-locked loop control circuit with phase comparator for conducting a phase comparison between the video signal cutoff sync pulses and the output of the oscillator, where the time error has a periodic sequence, comprising, means connected to said oscillator for periodicially phase-controlling it by the time error period or an integral multiple thereof.

4,220,969

DIGITAL SCAN CONVERTER

Kazuhiko Nitadori, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1978, Ser. No. 934,058

Claims priority, application Japan, Aug. 15, 1977, 52-96934

Int. Cl.² H04N 5/02

U.S. Cl. 358—140 **8 Claims**

1. A digital scan converter for converting the coordinate system of a picture signal from a first coordinate system at a first rate to a second coordinate system at a second rate comprising;

(a) an input terminal for receiving time sequential digital data at the first rate with the addresses of the first coordinate system,

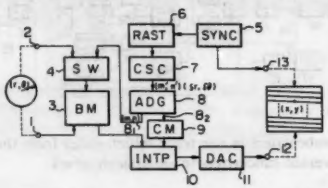
(b) a digital memory for storing the digital data applied to the input terminal according to the first coordinate addresses,

(c) a synchronization signal generator,

(d) a raster address generator which generates the addresses in the second coordinate system synchronized with the output of said synchronization signal generator,

(e) a coordinate system converter for converting the second coordinate system from said raster address generator to the first coordinate system,

(f) an address generator for composing the addresses of said digital memory in the first coordinate system according to the output of said coordinate system converter,



(g) a fixed coefficient memory for storing a sampling function,

(h) an interpolation circuit connected to the outputs of said digital memory and said coefficient memory for carrying out the interpolation of the output of said digital memory, and

(i) an output terminal for providing the converted second coordinates image signal with the synchronization signal from said synchronization signal generator and the image signal from the output of said interpolation circuit.

4,220,970

CIRCUIT ARRANGEMENT FOR IDENTIFYING TELEVISION SIGNALS

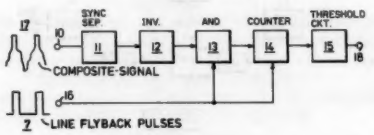
Ibolya Haraszti, Heilbronn; Peter Lackner, Talheim, and Willy Minner, Schwaigern, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 856,975

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654847

Int. Cl.² H04N 7/08, 5/44, 5/19, 5/44

U.S. Cl. 358—147 **6 Claims**



1. In a television set to which incoming television signals and other signals may be applied and demodulated, said television set comprising line flyback pulse supply means, a circuit arrangement for identifying the television signals, said circuit arrangement being connected to said line flyback supply means and comprising synchronizing pulse separating means to derive, from the demodulated incoming signal during the time period of a line flyback pulse, a sample of a signal having an amplitude within the range of synchronizing signal components of a television signal, and means responsive to amplitude jumps in said sample during the time period of a line flyback pulse to determine the number of such jumps during said time period as a criterion for the identification of an incoming television signal, said means responsive to amplitude jumps comprising, an AND circuit connected to said synchronizing pulse separating means and to said line flyback pulse supply means, a digital counter circuit connected to the output of said AND circuit to receive the output pulses of said AND circuit as

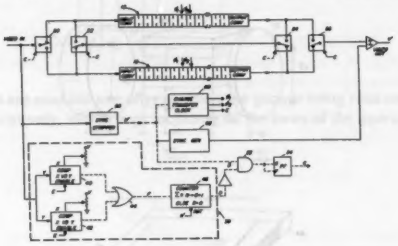
counting pulses, and means supplying the flyback pulses to said digital counter circuit as gate pulses therefor.

4,220,971

RECIPROCATING DROPOUT COMPENSATOR

David N. Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1977, Ser. No. 824,137
Int. Cl.[2] H04N 5/14
U.S. Cl. 358—160 5 Claims



1. Corrective apparatus for processing a video signal of the type having a succession of segments corresponding to line scans, where such segments may exhibit a detectable impairment, said corrective apparatus comprising:

(a) a first and a second shift register;

(b) means, responsive to said video signal, for activating signal transfer through said registers at a rate corresponding to the video line rate;

(c) switch control means, responsive to the video signal, for producing a control signal that normally alternates between a first state and a second state from one video signal segment to the next;

(d) video signal switching means, responsive to said first state of said control signal, for connecting said first register to receive a video signal segment for storage and for connecting said second register

(1) to read out a stored video signal segment to an output channel, and

(2) to recirculate such stored video signal segment for continued storage,

said video signal switching means being responsive to said second state of said control signal to reverse the connections to said first and second registers;

(e) means for detecting an impaired video signal segment and for producing a defect flag signal in the event of a detection; and

(f) means, responsive to said defect flag signal, for disabling the state change of said control signal produced by said switch control means in the event of an impaired signal detection by said detection means, whereby the normal reversal in register connection is cancelled and a recirculated signal segment is substituted for the impaired signal segment.

4,220,972

LOW CONTRAST OBJECT EXTRACTION DEVICE

Meletios Geokezas, New Brighton; Rodney M. Larson, Anoka, and David V. Serreyn, Wayzata, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 22, 1979, Ser. No. 41,453
Int. Cl.[3] H04N 5/14
U.S. Cl. 358—166 7 Claims

1. A system for automatically thresholding edge and intensity (bright) signals for the extraction of low contrast objects in a video image comprising:

a weighted average low pass video data smoothing filter, means for reducing input noise;

an edge filtering system for determining the edge of an object, said edge filtering system further comprising:

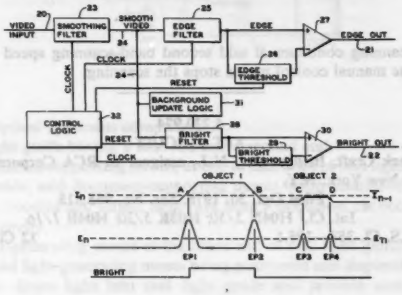
means for determining the absolute value of the relative intensity differences of pixels of interest in order of scanning;

means for successively averaging the intensity of pixels of interest in each scan line and applying a constant factor thereto to produce an edge threshold value;

means for sequentially obtaining the difference between the edge intensity of the pixels of interest in the next scanned line of interest with said edge threshold value to produce a logic output;

a bright filtering system for determining logical bright portion of a scene indicative of an object of interest said bright filter system further comprising:

means for determining the background threshold value



wherein said background threshold value is the average of the absolute value of the difference in background estimate intensity between the current scan line of interest and the last scan line of interest based on pixels of interest with a constant having been applied thereto, and storing said value;

means for sequentially obtaining a first difference wherein said first difference is the difference between the value of the intensity of each pixel of interest in the current scan line of interest and the value of the intensity of the background estimate for the same pixel;

means for sequentially obtaining the difference between said first difference output and said background threshold for each pixel of interest in the current scan line of interest to produce a logic output;

control system for controlling said edge and bright filter systems.

4,220,973

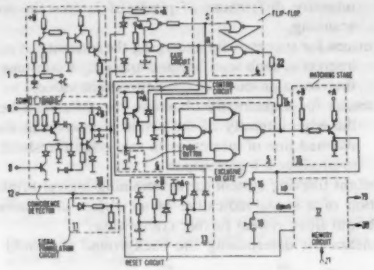
TWO-SPEED SEARCHING TELEVISION TUNER

Emilio Macchetta, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Jul. 26, 1978, Ser. No. 927,978
Claims priority, application Italy, Jul. 26, 1977, 68737 A/77
Int. Cl.[2] H04N 5/48
U.S. Cl. 358—193.1 10 Claims

1. A television tuning device comprising a circuit scanning means for continuously scanning at least one band of receivable frequencies, manual control means for starting and stopping said scanning, a terminal means for applying a switch signal to said scanning means for switching from a first band-scanning speed to a second band-scanning speed lower than the first, and detection means for detecting the presence of a television channel by comparing received synchronization signals with local signals generated in the television receiver and for applying a switch signal to said terminal means for switching

from said first band-scanning speed to said second band-scanning speed in the presence of said switch signal so that the band



scanning continues at said second band-scanning speed until the manual control means stops the scanning.

4,220,974

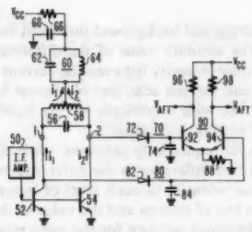
AFT CIRCUIT

Jack Craft, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,515

Int. Cl.[2] H04N *5/50*; H03K *5/20*; H04B *1/16*

U.S. Cl. 358—195.1 **12 Claims**



4. In an automatic frequency control signal circuit including an integrated circuit chip having first, second and third contact areas for coupling to discrete circuit elements located external to said integrated circuit chip, apparatus comprising:

means located on said integrated circuit chip for supplying input signals having a frequency within a band including a predetermined reference frequency to said first and second contact areas;

a discriminator network, located external to said integrated circuit chip and coupled to said first and second contact areas, and responsive to said input signals for providing respective signals at said first and second contact areas which vary differentially in magnitude in response to the frequency deviation of said input signals from said reference frequency;

first and second detector networks located on said integrated circuit chip and having respective input terminals coupled to said first and second contact areas for detecting the magnitudes of said differentially varying signals;

a differential amplifier located on said integrated circuit chip and coupled to said detector networks for developing output signals which vary differentially in sense and magnitude in response to the detected magnitudes of said differentially varying signals; and

means located or said integrated circuit chip and coupled to said differential amplifier for combining said output signals to develop an automatic frequency control signal at said third contact area which varies in sense and magnitude in response to the frequency deviation of said input signals from said predetermined reference frequency.

4,220,975

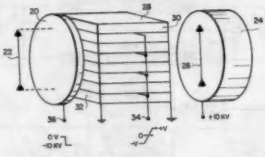
PROXIMITY FOCUSED SHUTTER TUBE AND CAMERA

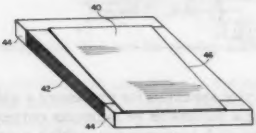
Albert J. Lieber, and Howard D. Sutphin, both of Los Alamos, N. Mex., assignors to General Engineering & Applied Research Inc., Los Alamos, N. Mex.

Filed Aug. 7, 1978, Ser. No. 931,730

Int. Cl.[2] H04N *5/30*

U.S. Cl. 358—209 **15 Claims**





14. A camera comprising:

a focusing lens,

a proximity focused shutter tube including a photocathode for receiving a photon image from said focusing lens and converting said images to photo-electrons, a phosphor screen for receiving said photo-electrons, and a shutter for said photo-electrons positioned between said photocathode and said phosphor screen, said shutter comprising a plurality of microchannel plates, each plate having a front face adjacent to said photocathode, a back face adjacent to said phosphor screen, first and second major surfaces, and a plurality of microchannels between said first and second major surfaces and extending from said front face to said back face in parallel axial alignment, at least one major surface of each plate having an electrode thereon, said plurality of microchannel plates being stacked in array with at least one of said electrodes between adjacent plates, conductor means for applying a voltage to said plates whereby electrical fields can be established between the major surfaces of each plate, and

a film carrier positioned adjacent to said phosphor screen for recording an image on said phosphor screen.

4,220,976

READ-OUT PROCESS FOR A CID SENSOR MATRIX

Rudolf Koch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,610

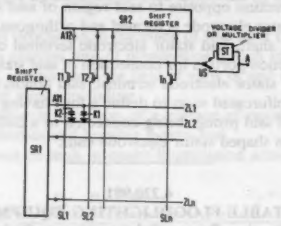
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2702024

Int. Cl.[3] H04N *3/14*; H01J *40/14*

U.S. Cl. 358—213 **7 Claims**

1. A process for reading out an image sensor matrix having sensor elements arranged in rows and columns, wherein each read-out process is composed of two sub-processes which follow one another in time, comprising the steps of: in the first sub-process, reading out one after another the items of information of the sensor elements provided in each individual row and reading out the rows consecutively; and in the second sub-process reading out the items of information from consecutive groups of individual rows, each group comprising at least

two rows, corresponding items of information in rows of the same group being summed to form items of sum information



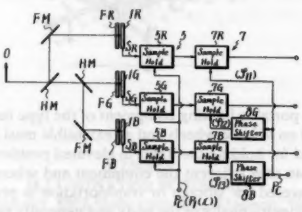
which are read out one after another, the groups being read out consecutively, said groups including all the rows of the matrix.

4,220,977

SIGNAL TRANSMISSION CIRCUIT

Seisuke Yamanaka, Mitaka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 24, 1978, Ser. No. 954,099
Claims priority, application Japan, Oct. 27, 1977, 52/128913
Int. Cl.³ H04N *3/15*
U.S. Cl. 358—213 **12 Claims**



1. A signal transmission circuit comprising:
(a) a first sample-hold circuit for receiving an incoming signal and supplying sample-hold output signal;
(b) a first sampling pulse supplied to said first sample-hold circuit;
(c) a low pass filter circuit to be supplied with said sample-hold output signal from said first sample-hold circuit;
(d) a second sampling circuit connected to said low pass filter for re-sampling an output from said low pass filter circuit; and
(e) a second sampling pulse supplied to said second sampling circuit.

3. A signal transmission circuit as claimed in claim 1, wherein a frequency f_1 of said first sampling pulse is equal to a frequency f_2 of said second sampling pulse, and a cut-off frequency f_{cut} of said low pass filter is selected to be about said frequency.

4. A signal transmission circuit as claimed in claim 3, wherein said second sampling circuit includes a signal-hold circuit, and the phase of the second sampling pulse is adjustable relative to said first sampling pulse.

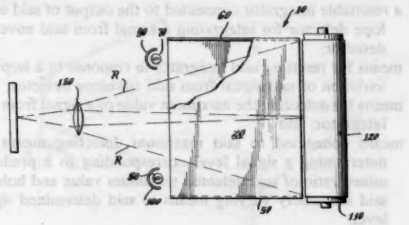
7. A signal transmission circuit as claimed in claim 4, where said signal transmission circuit is applied to a solid stage image pick-up system having a plurality of image sensing chips.

4,220,978

ELECTRO-OPTICAL DOCUMENT READER

Richard W. Rhyins, Ridgefield, and Antoon M. Hurkmans, Bethlehem, both of Conn., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jul. 8, 1977, Ser. No. 813,946
Int. Cl.² H04N *1/10*
U.S. Cl. 358—293 **20 Claims**



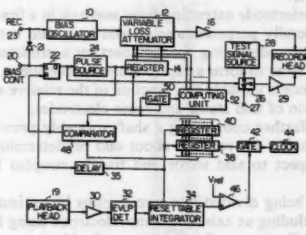
1. Optical apparatus comprising
a light guide having a first end and a second end,
document-supporting means, at one of said ends of said light guide, said document-supporting means being positioned to receive and reflect light rays from a document carried thereby,
light-generating means at the other end of said light guide, said light-generating means being positioned and disposed to direct light into said light guide and provide non-uniform distribution of light intensity along said document at said one end of said light guide, and
utilization means, including optical means, positioned to receive reflected light reflected from said document back through said light guide, said optical means having a non-uniform transmission characteristic which is compensated for by the non-uniform distribution of intensity of said light from said light-generating means.

4,220,979

BIAS LEVEL SETTING CIRCUIT FOR TAPE RECORDERS WITH STAIRCASE HIGH FREQUENCY SIGNAL

Masatsugu Kitamura; Hideo Onoye, and Masami Yamazaki, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Filed Mar. 28, 1979, Ser. No. 24,875
Claims priority, application Japan, Mar. 29, 1978, 53-35485
Int. Cl.² G11B *5/47*
U.S. Cl. 360—66 **7 Claims**



1. An automatic bias level setting circuit for a tape recorder having a bias oscillator for generating an ultransonic frequency signal of a constant amplitude, comprising:
means for stepwisely varying the signal level of said ultrasonic frequency bias signal as a function of time for appli-

cation to an electromagnetic transducer head of said tape recorder operating as a recording head;

a source for generating an audible frequency test signal of a constant amplitude for application to said recording head to record said test signal in superposition with said stepwisely varying bias signal;

an envelope detector connected to said electromagnetic transducer head of the tape recorder operating as a playback head to detect the envelope of said recorded signal;

a resettable integrator connected to the output of said envelope detector for integrating a signal from said envelope detector;

means for resetting said integrator in response to a stepwise variation of said signal from said envelope detector;

means for detecting the maximum value of a signal from said integrator; and

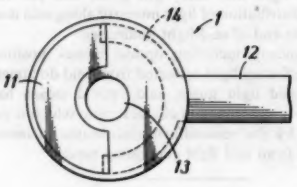
means connected to said maximum detecting means for determining a signal level corresponding to a predetermined ratio of said detected maximum value and holding said stepwisely varying means to said determined signal level.

4,220,980

TRIMMER CAPACITOR

Takami Yamamoto, Muko, and Yukihiro Azuchi, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Aug. 21, 1978, Ser. No. 935,264
Claims priority, application Japan, Sep. 1, 1977, 52-118353[U]
Int. Cl.³ H01G *5/06*
U.S. Cl. 361—293 **9 Claims**



1. A trimmer capacitor, comprising:

a stator including a stator electrode and a stator electrode terminal electrically connected to said stator electrode and extending outwardly from said stator so as to provide an external electrical connection to said stator electrode;

a rotor connected to said stator for rotation about a predetermined axis and including a rotor electrode and a rotor electrode terminal electrically connected to said rotor electrode and extending outwardly from said rotor so as to provide an external electrical connection to said rotor electrode;

said stator electrode extending from said axis in a first direction generally perpendicular to said axis, said rotor and stator electrodes being spaced apart by a predetermined distance so as to form a capacitance therebetween, which capacitance is variable as a function of the relative angular orientation of said stator and rotor electrodes;

said rotor further comprising a shaft rotatably provided in said capacitor for rotation about said predetermined axis with respect to said stator and fixedly coupled to said rotor;

said stator being divided into two regions by an imaginary plane including an axis, said stator electrode being formed substantially in one of said regions of said stator;

said stator electrode formed in a fan shape including two ends with the center of said stator electrode being coaxial with the axis of said shaft, said fan shaped stator electrode being formed in said stator close to said rotor, said stator electrode terminal being provided on a surface of said electrode which is further from said rotor; than said stator electrode and

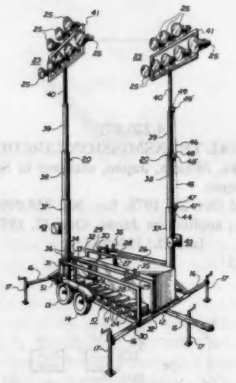
said stator electrode terminal extending from said stator in the direction opposite to said region of said stator where said stator electrode is formed and orthogonal to said axis of said shaft, said stator electrode terminal comprising a connection portion for connection of said stator electrode to said stator electrode terminal, said connection portion being bifurcated so as to define a fork having two prongs each of said prongs being connected to a different one of said fan shaped stator electrode ends.

4,220,981

PORTABLE FLOODLIGHTING EQUIPMENT

Herbert F. Koether, Denver, Colo., assignor to Over-Lowe Company, Inc., Englewood, Colo.

Filed Apr. 14, 1978, Ser. No. 896,446
Int. Cl.² F21L *15/08*; F21M *1/00*
U.S. Cl. 362—61 **5 Claims**



1. In a portable lighting equipment of the type having a body mounted on vehicle wheels and an extensible mast for carrying lights and for holding the lights in elevated positions for floodlighting an area adjacent the equipment and wherein the mast when lowered for storage or transportation is pivoted into a position longitudinally of the body and generally parallel to the ground or supporting surface, the improvement which comprises a first extensible mast mounted on the body adjacent one end and toward one side of the body, a second extensible mast mounted adjacent the other end of the body and toward the other side thereof diagonally of the body from the first mast whereby said masts upon being lowered and pivoted more in spaced parallel vertical planes, each of said masts having at its upper end a light assembly having a plurality of lights thereon, said upper ends of said masts in their lowered positions being located adjacent respective opposite ends of said body, and means for positioning said lights to direct light from the assembly on each mast to selected areas about said equipment whereby the area on either side of said equipment may be lighted by both light assemblies or the lights may be directed to selected portions in the entire area surrounding the equipment.

4,220,982

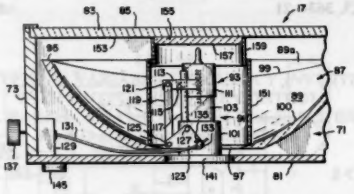
HIGH INTENSITY ILLUMINATION LIGHT TABLE

Ronald J. Martino, Geneva, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jan. 16, 1978, Ser. No. 869,968
Int. Cl.² G09F *13/04*
U.S. Cl. 362—97 **19 Claims**

1. A high intensity light table for transilluminating film for viewing with microscope optics, said light table comprising:

(a) housing means;
(b) a plano light transmitting surface supported by said housing means;
(c) means for producing in the plane of said light transmitting surface an annular ring of illumination which fills both the numerical aperture and the field of view of said microscope optics, said means including
(i) a reflector in the form of a surface of revolution positioned within said housing means, and
(ii) a source of high intensity illumination nominally positioned at the center of focus of said reflector whereby, when said source is energized, said reflector produces an annular image of said source; and



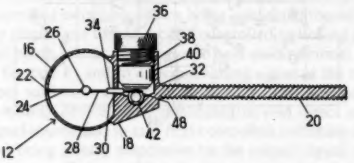
(d) means for diffusing said annular ring of illumination to thereby eliminate both the image of said source and the scratches and other defects on a film surface which, if illuminated by non-diffused light, would be visible when viewed through said microscope optics, said diffusing means located in the light path between said source and said light transmitting surface and beyond the depth of focus of said microscope optics.

4,220,983

ILLUMINATED BOWSIGHT

Gary P. Schroeder, 5002 Sheboygan Ave., Madison, Wis. 53705

Filed Dec. 18, 1978, Ser. No. 970,366
Int. Cl.[2] F41G 1/34, 1/32, 1/00
U.S. Cl. 362—114 **17 Claims**



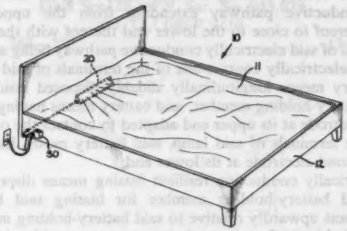
1. An illuminated bowsight comprising:
a. a body member having a cavity defined therein;
b. mounting means attached to the body member for mounting the bowsight on the bow;
c. a circular sighting ring attached to the body member;
d. a battery received in the cavity in the body member; and
e. a light-emitting diode having two leads and mounted on the bowsight so as to be positioned in the center of the circle of the sighting ring with the leads being mechanically connected to the sighting ring to fasten the light-emitting diode in position, the light-emitting diode being electrically connected to the battery to provide a visible sighting mark in dim light.

4,220,984

ILLUMINATION DEVICE FOR A WATERBED

Michael B. Truher, and Sheryl L. Truher, both of 499 Ellis St., Pasadena, Calif. 91105

Filed Feb. 9, 1979, Ser. No. 10,612
Int. Cl.[2] A47B 23/06
U.S. Cl. 362—130 **3 Claims**



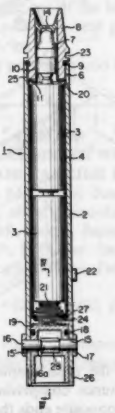
1. An illumination device for use in combination with a waterbed which includes:
a. a plastic membrane which takes the shape of a mattress when it is filled with water and which is adapted to be filled with water; and
b. a frame having a headboard, four legs and base which is adapted to receive the elastic membrane after it has been filed with water, said illumination device comprising:
a. a light source which is optically coupled to the water in the plastic membrane through the plastic membrane and which is mechanically coupled to the frame; and
b. electrical energy means for providing electrical energy to said light source whereby said light source illuminates the water within the plastic membrane thereby producing a glowing effect.

4,220,985

ILLUMINATION DEVICE

Hiroshi Hukuba, No. 914-1, Nazukari, Nagareyama-shi, Chiba-ken, Japan

Filed Feb. 1, 1979, Ser. No. 8,273
Claims priority, application Japan, Feb. 3, 1978, 53-10556; Oct. 31, 1978, 53-134110
Int. Cl.[3] F21L 7/00
U.S. Cl. 362—203 **15 Claims**



1. A lighting device, comprising:

an elongated tubular body having a lamp mounted on the upper longitudinal end thereof, said lamp having a pair of terminals;

an elongated, hollow, inner, battery-holding member disposed inside of said tubular body and extending lengthwise therein from adjacent said lamp toward the lower longitudinal end of said body, said battery-holding member being longitudinally movable inside said tubular body, said battery-holding member comprising an electrically conductive pathway extending from the upper end thereof to close to the lower end thereof with the upper end of said electrically conductive pathway being adapted to electrically contact one of the terminals of said lamp;

battery means longitudinally slidably disposed inside said battery-holding member, said battery means having a first electrode at its upper end adapted to contact the other of the terminals of said lamp, said battery means having a second electrode at its lower end;

electrically conductive resilient biasing means disposed in said battery-holding member for biasing said battery means upwardly relative to said battery-holding member to hold said first electrode in engagement with said other terminal of said lamp and to space the upper end of said battery-holding member from said one terminal of said lamp, said biasing means also electrically connecting said second electrode to said electrically conductive pathway of said battey-holding member; and

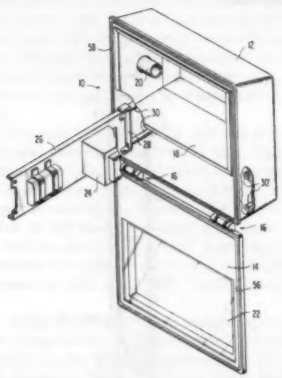
switching means mounted on said body for movement relative thereto, said switching means being coupled with said battery-holding member so that movement of said switching means relative to said body overcomes said biasing means and displaces said battery-holding member longitudinally upwardly in said body and longitudinally upwardly relative to said battery means whereby an electrical connection between the upper end of said electrically conductive pathway of said battery-holding member and said one terminal of said lamp can be made or broken and said lamp can thereby be energized or deenergized by movement of said switching means relative to said body.

4,220,986

HINGED BALLAST TRAY

Gene T. Matteo, Syracuse, and Wilbur A. Sensinger, Baldwinsville, both of N.Y., assignors to Crouse-Hinds Company, Syracuse, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,129
Int. Cl.[2] B60Q *3/04*
U.S. Cl. 362—362 **4 Claims**



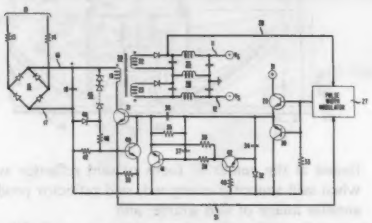
1. A ballast tray of the type adapted to be mounted in a housing for a light source comprising a U-shaped bracket pivotally connected at opposite ends thereof to one end of said ballast tray, means for detachably securing said U-shaped bracket to the housing and means at the opposite end of said ballast tray for detachably securing the opposite end of said ballast tray to the housing.

4,220,987

CONVERTER DRIVE CIRCUIT

Tadikonda N. Rao, Morris Township, Morris County, and Thomas G. Wilson, Jr., Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,381
Int. Cl.[2] H02M *3/335*
U.S. Cl. 363—21 **5 Claims**



1. A transistor base charge removal circuit for high power switching transistors

characterized by

charge storage means connected in shunt with the base-emitter path of said transistor for accumulating a charge during the time said switching transistor is enabled, and

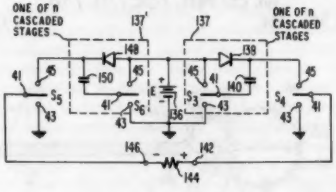
a base charge removal path for said switching transistor enabled by the charge on said charge storage means when said switching transistor is disabled.

4,220,988

CONTROLLER FOR WAVEFORM SYNTHESIZER

Richard H. Baker, Bedford, Mass., and Kevin E. White, Washington Township, Warren County, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 27, 1978, Ser. No. 890,462
Int. Cl.[2] H02M *1/12*
U.S. Cl. 363—43 **22 Claims**



1. A method for inverting a DC voltage into a multitiered step-like notched waveform equivalent of a predetermined AC waveform, comprising the steps of:

producing a reference AC waveform having a pattern corresponding to that of said predetermined AC waveform;

producing a plurality of AC sampling waveforms, level shifted from one another, and each having a frequency substantially greater than that of said reference AC waveform;

comparing each one of said plurality of sampling waveforms with each positive and negative half-cycle of said reference waveform for producing first and second sets of pulse width modulated pulse trains, respectively, the pulse widths of the pulses of each one of said pulse trains corre-

sponding to the period of time that the amplitude of its associated sampling waveform exceeds the absolute amplitude of said reference waveform between two successive intercepts thereof, the number of pulse trains in each one of said first and second sets of pulse trains being equal to the number of said plurality of sampling AC waveforms; and

applying said first and second sets of pulse trains to an inverter circuit, for operating the inverter circuit to produce said multitiered step-like notched waveform, the number of tiers of each half-cycle of which are substantially equal to the number of said plurality of sampling AC waveforms.

4,220,989

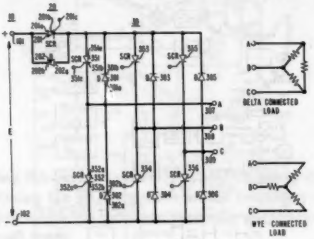
POLYPHASE VARIABLE FREQUENCY INVERTER WITH OUTPUT VOLTAGE CONTROL

Fred M. Perilstein, 676 Park Ave., East Orange, N.J. 07017

Filed Dec. 8, 1978, Ser. No. 967,646

Int. Cl.[2] H02P *13/18*

U.S. Cl. 363—96 **8 Claims**



1. An inverter apparatus being jointly responsive to a constant potential signal from a direct current source and to a plurality of timing signals from an external control circuit for providing a three-phase alternating current signal to a load, said inverter apparatus comprising:

a chopper circuit including at least one controlled switching device being jointly responsive to said direct current signal and to a first timing signal at the rate F_1 from said control circuit for selectively producing a plurality of unidirectional pulses at said rate F_1; and

an inverter circuit including three controlled switching device branches in parallel with each other, each such branch further including first and second controlled switching devices in series with each other, each such first controlled switching device being connected to said chopper circuit and to said second controlled switching device and being jointly responsive to said unidirectional pulses at the rate F_1 and to a second timing signal at the rate F_2 from said control circuit; each such second controlled switching device being connected to said direct current signal source and to said first controlled switching device and being jointly responsive to the output signal of said first controlled switching device, to a third timing signal at the rate F_2 from said control circuit, and to said direct current signal, whereby a plurality of bi-directional pulses at the rate F_3 are selectively produced at the mid-point junction of each such controlled switching device branch, and whereby linear combinations of the voltages appearing at selected pairs of said mid-point junctions produce said three-phase alternating current signal;

either two or three of said inverter circuit controlled switching devices being gated ON at said rate F_2, then said chopper circuit controlled switching device being gated ON at said rate F_1, then said chopper circuit controlled switching device being gated OFF at said rate F_1, and then said two or three inverter circuit controlled switching devices being gated OFF at said rate F_2 when the residual current therein is substantially reduced.

4,220,990

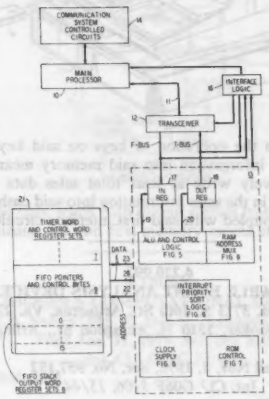
PERIPHERAL PROCESSOR MULTIFUNCTION TIMER FOR DATA PROCESSING SYSTEMS

Harold G. Alles, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 25, 1978, Ser. No. 945,078

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **12 Claims**



1. A method in a multifunction timer for a communication system main processor (**10**) in which timer respective interval-defining data words are stored in an addressable memory (**21**) having a plurality of timer register sets (**7**) and a plurality of temporary storage register sets (**8**), and the words are recurrently and sequentially processed to time the intervals by a peripheral processor (**13**) coupled for accessing said memory and coupled for communicating with said main processor, the method comprising the steps of

recurrently and sequentially processing data words in said timer register sets, respectively, to effect respective time interval measurements,

entering into one of said timer register sets information provided from said main processor to initiate an interval measurement,

storing in one of said temporary storage register sets an indication of the timing out of the last mentioned interval in accordance with said recurrent processing of a corresponding data word, and

providing to said main processor said timing out indications one at a time.

4,220,991

ELECTRONIC CASH REGISTER WITH REMOVABLE MEMORY PACKS FOR CASHIER IDENTIFICATION

Koichi Hamano; Takao Morimoto; Junko Watanabe; Kaoru Ono, and Norio Yagi, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1978, Ser. No. 944,592

Claims priority, application Japan, Oct. 8, 1977, 52-121102; Oct. 8, 1977, 52-121105

Int. Cl.[2] G06F *15/02, 15/20*

U.S. Cl. 364—405 **34 Claims**

1. An electronic cash register comprising:

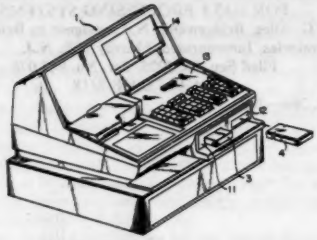
a keyboard having a plurality of entry keys and at least one function key;

memory means;

a cashier memory pack;

a first interface circuit with which said cashier memory pack is mechanically, electrically and removably coupled; and

a data processing unit connected to said keyboard, said memory means and said first interface, and which is responsive to the operation of keys on said keyboard to write sales information into said memory means and to accumulatively write at least total sales data for each transaction in the sales information into said cashier memory pack coupled with said first interface circuit.

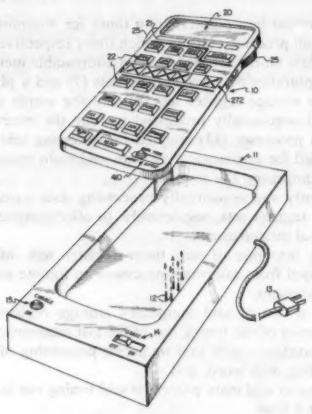


4,220,992

PORTABLE EVENT ANALYSIS DEVICE

Thomas S. Blood, 3711 S. 16th St., Arlington, Va. 22204, and Stephan F. Hooker, 1310 N. Abingdon St., Arlington, Va. 22207

Filed Nov. 3, 1978, Ser. No. 957,152
Int. Cl.[3] G06F 3/06, 15/44
U.S. Cl. 364—410 **9 Claims**



1. An apparatus for storing and retaining data describing a plurality of events and for selectively displaying cumulative descriptive information about those events comprising the combination of

a keyboard having a plurality of keys;

first logic means coupled to said keyboard for forming a digital word having a predetermined bit length in response to operation of at least one key;

an addressable memory;

a clock for producing a sequence of timing pulses;

a mode switch having an input position and an output position;

input logic means coupled to said memory for permitting successive parallel storage of each word formed by said first logic means when said mode switch is in said input position;

output logic means connected to said clock, said memory and said mode switch for responding to pulses from said clock only when said mode switch is in the output position to sequentially read out each word from said memory;

comparator means coupled to said first logic means and to said memory for comparing each word read out of said memory with a word formed in said first logic means and for producing an output signal when correspondence between the compared words exists; and

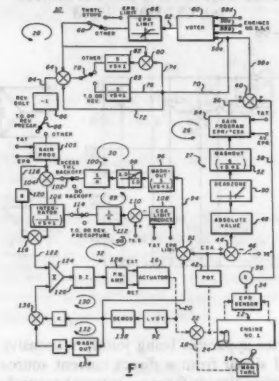
means for accumulating a count of said output signals and for displaying symbols representative of said count.

4,220,993

ENGINE THROTTLE CONTROL SYSTEM

Robert W. Schloeman, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 15, 1978, Ser. No. 942,518
Int. Cl.[2] G06G 7/66; G05D 1/00; B64C 13/16
U.S. Cl. 364—431 **9 Claims**



1. Apparatus for controlling the throttle of a turbine engine including series coupled manual and automatic throttle position controllers comprising:

means responsive to an operation characteristic of the engine for producing an engine status indicator signal,

means responsive to the rate of change of the absolute value of the position of the throttle in excess of a predetermined deadzone position for deriving a lag compensation signal,

means for combining said engine status indicator signal and said lag compensation signal for providing a lag compensated engine throttle control signal, and

means for supplying said lag compensated engine throttle control signal to said automatic throttle position controller.

4,220,994

GENERAL PURPOSE NAVIGATION AID DEVICE

Alvin E. Hendrickson, Chula Vista, Calif., assignor to Eldon W. Planalp, San Diego, Calif.

Filed Jul. 27, 1978, Ser. No. 928,635
Int. Cl.[3] G06F 15/50; G01S 7/04
U.S. Cl. 364—450 **3 Claims**

1. A method for assisting a pilot in the navigation of an aircraft which comprises:

compiling in a data processing apparatus a data base comprising the names, latitudes and longitudes of a plurality of airports located with the area travelled by the aircraft; and the name, frequencies latitudes and longitudes of a plurality of VOR stations detectable within said area;

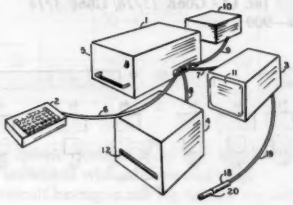
by means of said data processing apparatus,

indexing said data base whereby the information compiled therein for each said airport can be retrieved by calling

said airport name, and the information compiled therein for each said station can be retrieved by calling said station name or said station frequency,

computing as needed the distance and heading from any of said airports or stations to any other airport or station using their respective latitude and longitude retrieved from said data base;

dead-reckoning the location of the aircraft as needed by retrieving from said data base the names and sets of coordinates of any two VOR stations detected by an aircraft VOR receiver, computing the distance and heading between the two VOR stations and computing the distances between the aircraft and each said two VOR stations in function of the distance and heading between the VOR station and the radial bearing detected by the receiver from each station;



checking the performance of the aircraft along its itinerary by tuning the VOR receiver to the frequency of a VOR station which has radials substantially perpendicular to the aircraft track;

by means of said data processing apparatus, retrieving from said data base the latitudes and longitudes of said VOR station and of the airport of departure or the airport of arrival,

computing the distance and heading between said airport and said VOR station in function of said latitudes and longitudes; and

computing the distance travelled in function of the current radial bearing detected by the VOR receiver from said VOR station and said distance and heading between said airport and said VOR station.

4,220,995

APPARATUS FOR DETECTING TIP DAMAGES OF A MILLING CUTTER

Hiroshi Shoda, Kaga, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,555

Claims priority, application Japan, May 30, 1978, 53/63808

Int. Cl.[2] G06F *15/46*; G01N *3/58*

U.S. Cl. 364—508 **10 Claims**

1. An apparatus for detecting tip damages of a milling cutter comprising vibration detector means mounted on the milling cutter;

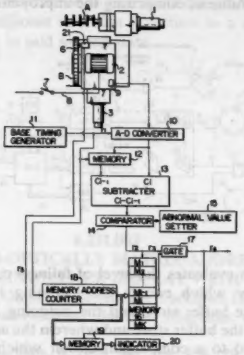
vibration increase calculating means connected to said vibration detector means for calculating increases in vibration at every preset time;

abnormal vibration increase preset means;

comparator means connected with said vibration increase calculating means and with said abnormal vibration increase preset means for comparing output signals thereof;

first memory means connected with said comparator means for storing abnormal condition indicating signals from said comparator means; and

gate means connected with said comparator means and with said first memory means, said gate means being adapted to send out cutter abnormal condition indicating signals as an



output only when both output signals from said comparator means and said first memory means are abnormal.

4,220,996

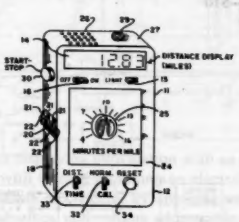
JOGGER'S COMPUTATIONAL DEVICE

Talmadge R. Searcy, 515 W. Dee St., Lebanon, Ill. 62254

Filed Jan. 31, 1979, Ser. No. 8,193

Int. Cl.[2] G01C *22/00*

U.S. Cl. 364—561 **20 Claims**



1. A portable self-contained computational device for use in pacing and measuring the extent of repetitive athletic activities, said device comprising first selector means for preselecting a distance of movement, second selector means for preselecting a user's desired speed of said athletic activities, means for providing repetitive signals at a pacing cue rate as a function of said preselected distance of movement and desired speed, means for providing perceptible pacing cues to the user in response to said repetitive signals, first accumulator means for accumulating incremental distance measurements, and display means for displaying the accumulated distance measurements to the user.

4,220,997

PROCESS AND APPARATUS FOR TRANSFERRING INFORMATION BETWEEN AN INFORMATION STORE AND A DATA CHANNEL

Horst Hager, Schloss Neuhous, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Jul. 27, 1977, Ser. No. 819,615

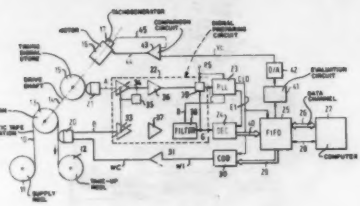
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639895

Int. Cl.[2] G06F *13/04*; G11B *15/46*

U.S. Cl. 364—900 **17 Claims**

1. An apparatus for transferring information signals from a variable speed information store into a data processing system

having a data channel and a cyclically operating buffer store enabling asynchronous storage and retrieval of information and having an associated circuit which evaluates it respective level of fullness, comprising the improvement wherein the



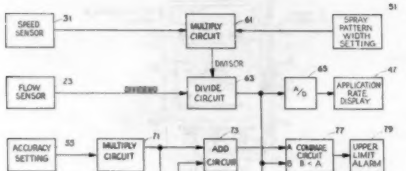
circuit which evaluates the level of fullness comprises an address counter which counts the incoming information for storage in the buffer store and the outgoing information retrieved from the buffer store and wherein the address counters are connected to a comparison circuit which compares the counter positions, which comparison circuit delivers to its output a signal which indicates the speed of the information store.

4,220,998

ELECTRONIC LIQUID APPLICATION RATE MONITORING SYSTEM

Sandra E. Kays, 515 Milledge Heights, Athens, Ga. 30606

Filed Apr. 24, 1978, Ser. No. 899,167
Int. Cl.[2] G05B *12/00*
U.S. Cl. 364—510 **10 Claims**



1. In mobile liquid application apparatus including a vehicle, multiple liquid applicators mounted thereto and a liquid conduit supplying liquid to said applicators; apparatus for monitoring the application rate per unit area of a liquid sprayed by said equipment comprising

a flow meter for generating a signal representative of the volumetric flow rate of liquid in said liquid conduit,

a speedometer for generating a signal representative of the speed of said vehicle,

an adjustable pattern width signal generator for generating a signal representative of the width of pattern produced by said applicators,

means for producing from the above said signals a single signal representative of the liquid flow rate divided by the product of the vehicle speed and the spray pattern width setting,

means for indicating the value of the last said single signal,

an adjustable desired application rate signal generator for generating a signal representative of the desired application rate,

an adjustable application rate accuracy signal generator for generating a signal representative of the application rate accuracy,

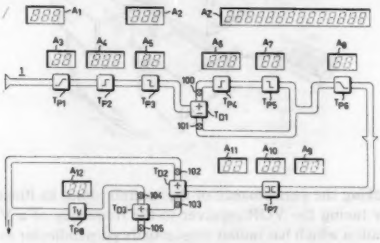
and means for generating from said desired application rate signal and application rate accuracy signal an upper rate limit signal and a lower rate limit signal, for comparing said single signal with said upper rate limit signal and said lower rate limit signal and for generating an operator-discernible signal when said single signal is outside the limits of said lower limit application rate signal and said upper limit application rate signal.

4,220,999

CONTROL PANEL FOR AN ELECTRONIC DEVICE

Anton Reichlin; Harald Richter, both of Zürich, and Hans Paluschinski, Wallisellen, all of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed Jul. 17, 1978, Ser. No. 925,477
Claims priority, application Switzerland, Oct. 12, 1977, 12442/77
Int. Cl.[2] G06K *15/18*; G06F *3/14*
U.S. Cl. 364—900 **4 Claims**



1. In a control panel for an electronic device for use in medical applications, in particular an electro-medical device equipped with a digital process computer which controls a work process as a function of a predetermined number of data records which are to be infed, a device for the infeed of the data records and digital display elements for the data records, an additional display element correlated to the last infed data record which has been infed by the device for the infeed of the data records, the improvement which comprises:

said digital display elements being present in the same number as the number of data records;

each data record being unambiguously correlated to a respective predetermined digital display element; and

said additional display element constituting a check display for enabling checking of each infed data record before such data record is transferred to its correlated predetermined digital display element.

4,221,000

IMPROVED BUBBLE DOMAIN STORAGE ARRAY

Alina Deutsch, Mount Kisco; Mark H. Kryder, Yorktown Heights, both of N.Y., and Walter Nystrom, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1978, Ser. No. 902,657
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—2 **12 Claims**

2. A magnetic bubble domain storage system, comprising:

an array of bubble domain chips for storing patterns of magnetic bubble domains, said arrays comprising:

first rows of chips for storing even numbered bits in an information sequence of bits,

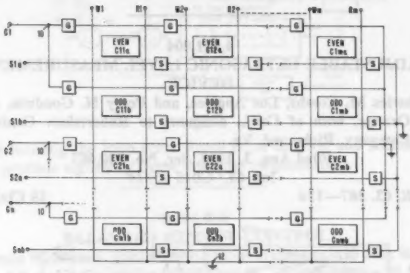
second rows of chips for storing odd numbered bits in an information sequence of bits,

each bubble domain chip including a bubble domain generator for writing bubble domains into said chip and a bubble domain sensor for sensing bubble domains in said chip,

write selection means for writing bubble domains produced

by said generators into any selected chip for storing even numbered bits and into any selected chip for storing odd numbered bits,

read selection means for reading bubble domains from a selected one of said chips, said read selection means including means for electrically connecting in series the sensors associated with each row of chips, and means for



moving bubble domains from any selected chip to the sensor associated with said selected chip,

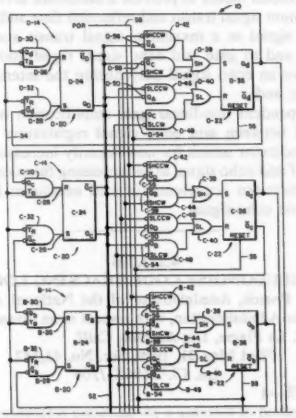
a bridge circuit having as one leg thereof the series connection of sensors associated with any of said first rows of chips and having as another leg thereof the series connection of sensors associated with any of said second rows of chips.

4,221,001

SHIFT REGISTER SUITABLE FOR CONTROLLING THE ENERGIZATION OF A MULTIWINDING MOTOR

Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 1, 1977, Ser. No. 783,586
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—78 **15 Claims**



1. A shift register having at least three stages, each of the stages having first and second stable states, which comprises:

means for placing at least one of said stages in the first state and at least two of said stages in the second state;

means for alternately applying first and second control signals to said shift register;

first means responsive to said first signal for placing any stage adjacent in a first direction to a stage in the first state in said first state; and

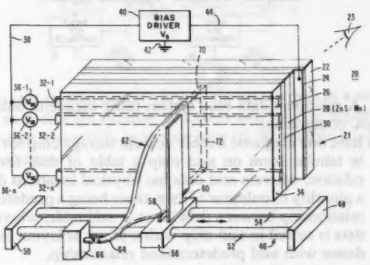
second means responsive to said second signal for placing any stage adjacent in a first direction to a stage in the second state in said second state.

4,221,002

ELECTRO-OPTICALLY MATRIX-ADDRESSED ELECTROLUMINESCENCE DISPLAY WITH MEMORY

Paul M. Alt, and Omesh Sahni, both of Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,228
Int. Cl.[2] G11C *13/04, 11/42*
U.S. Cl. 365—111 **7 Claims**



5. Apparatus for displaying information with an electroluminescent material with storage including an electroluminescent layer row addressable electrically by applying voltage to respective row conductors, and column addressable optically by applying illumination sequentially to respective column locations, said electroluminescent layer having at least one hysteresis path in the luminance output versus applied voltage input comprising:

(1) means for maintaining all said row conductors at a sustaining potential value $V_A = V_S$ where $V_{MIN} < V_S < V_I$, where

V_{MIN} = the lowest voltage in the hysteresis regime at which there is emitted light,

V_A = the amplitude of the applied voltage,

V_S = the sustain voltage amplitude and is a voltage level between V_I and V_{MIN}, and

V_I = the lowest voltage for which the actual luminance of the electroluminescent material can be switched to a stable on-state with intensity I;

(2) means for applying a selected illumination of intensity I-a such that the threshold $V_{I\text{-}a}$ for switching to a stable on-state is within the hysteresis voltage range $V_{MIN} < V_{I\text{-}a} < V_T$

where V_T is the threshold for voltage switching in the absence of any illumination, and V_{MIN} is the minimum voltage for light emission in the hysteretic range; and

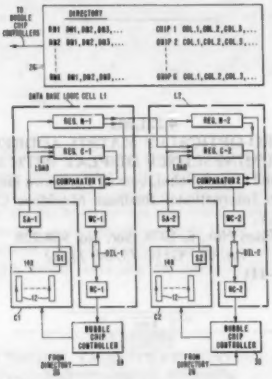
(3) means for applying a write potential V_W which is algebraically added to the sustain voltage V_S such that $V_S + V_W$ is greater than $V_{I\text{-}a}$ and less than V_T, whereby row conductors receiving said potential will switch to a stable on-state in areas which receive simultaneously light intensity I-a.

4,221,003

BUBBLE DOMAIN RELATIONAL DATA BASE SYSTEM

Hsu Chang, Yorktown Heights, and Anil Nigam, Rochester, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1978, Ser. No. 902,641
Int. Cl.[2] G06F 7/00, 13/00; G11G 11/14, 19/08
U.S. Cl. 364—900 12 Claims



1. A relational data base system using magnetic bubble domains, comprising:

at least one magnetic bubble domain storage chip for storing in tabular form on said chip a table of data forming a relation, wherein said data has physical locations defining a plurality of columns of data, there being a predetermined relationship between data items in said table, wherein said data is stored in said chip with a physical layout in accordance with said predetermined relationship,

access means located on said storage chip for accessing selected columns of data from said table,

sensor means located on said storage chip for detecting bubble domains in said chip,

a directory for keeping track of the magnetic bubble domain chip in which a particular data table is stored and the location of columns of data in said tables, said directory being a storage unit for storing the addresses of said tables of data and being connected to a bubble chip controller which enables access of selected data within any of said tables of data, said directory including means for receiving inputs from a user of said relational data base system,

a first data base logic cell connected to said storage chip and to said controller for performing queries relative to said data, said cell including:

comparator means connected to receive data read from said storage chip for comparing the content of data in said chip with test criteria to determine match/mismatch thereof, wherein data which matches said test criteria is termed qualified data,

at least one register connected to said comparator for providing said test criteria to said comparator,

at least one dynamic indexing register connected to said comparator and responsive to the output of said comparator for keeping track of the matches in said comparator,

a bubble chip controller connected to said access means for selecting particular data items from said table of data in said chip, said bubble chip controller being connected to said directory and to said dynamic indexing register to receive inputs therefrom to determine which of said data items are to be accessed after said comparison is made, said controller also being connected to write and read circuits on said storage chip for writing data into storage and for reading data from storage,

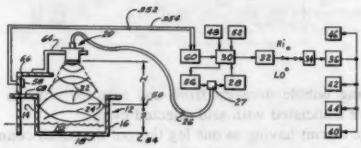
means including said comparator means connected to said dynamic indexing register for updating the content of said at least one dynamic indexing register to place information bits into said indexing register indicative of only those data items from said table which have satisfied cumulative comparisons of data and test criteria in said comparator wherein said controller receives the output from said dynamic indexing register in order to access only those data items from said table of data which have satisfied said cumulative comparisons.

4,221,004

ADJUSTABLE ULTRASONIC LEVEL MEASUREMENT DEVICE

Charles M. Combs, Los Angeles, and Perry H. Goodwin, Jr., Orange, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 3, 1978, Ser. No. 930,667
Int. Cl.[3] G01S 15/18
U.S. Cl. 367—114 18 Claims



1. An ultrasonic level flow detector for measuring the depth of a fluid flowing in a channel comprising:

ultrasonic transducer means mounted above said channel for transmitting ultrasonic signals toward said channel and for receiving reflected ultrasonic signals therefrom;

receiving means for detecting ultrasonic signals received by said ultrasonic transducer means;

echo signal registration means coupled to said receiver for registering the occurence of an echo signal;

indicator means connected to said echo signal registration means for expressing the occurrence of said echo signal as an indication of fluid flow level;

adjustable discriminator means connected to said echo signal registration means to provide a maximum level signal at a minimum signal transit and reflection time and a minimum level signal at a maximum signal transit and reflection time, and to gate said echo signal registration means to receive an echo signal only during the interval therebetween; and

time dependent non-linear gain amplification means interposed between said echo signal registration means and said indicator means for non-linearily increasing amplication of said echo signal as an increasing function of elapsed time between occurrence of said maximum level signal and said echo signal.

4,221,005

PSEUDONOISE CODE TRACKING LOOP

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and David T. La Flame, Los Angeles, Calif.

Filed May 21, 1979, Ser. No. 41,142
Int. Cl.[3] H04K 1/04
U.S. Cl. 375—1 15 Claims

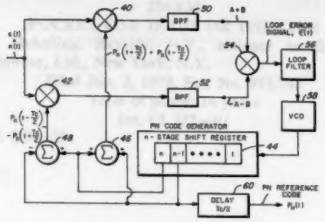
11. A method of forming a pseudonoise reference code from an incoming signal, comprising:

(a) generating a multiple bit pseudonoise reference code in response to a loop error signal;

(b) forming signals representing the sum and the difference between two selected bits of the pseudonoise reference code;

(c) forming a first product signal from the sum signal and the incoming signal;

(d) forming a second product signal from the difference signal and the incoming signal;



(e) forming the loop error signal from the first and second product signals to cause said step of generating.

4,221,006

BALANCED REMOTE CONTROL

Morton Weintraub, 1542 47th St.; Elliot Waxman, 1825 50th St., and Bernard Gendelman, 1340 52nd St., all of Brooklyn, N.Y. 11219

Continuation-in-part of Ser. No. 911,162, May 30, 1978, Pat. No. 4,145,720. This application Mar. 19, 1979, Ser. No. 21,553

Int. Cl.[2] H04B *1/16*

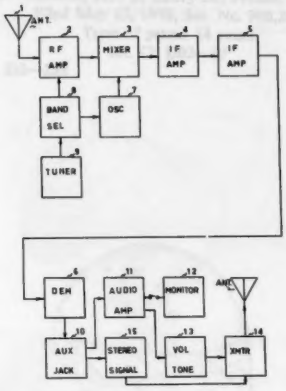
U.S. Cl. 455—355 **10 Claims**

1. A remote control system for continuously controlling one or more functions of one or more receivers comprising:

(a) a transmitter including means for generating a carrier wave,

(b) means for modulating said carrier wave with plural subcarriers each subcarrier conveying information relative to a specific function to be controlled or varied at said one or more receivers,

(c) means at said transmitter for sensing the condition or state of the said receiver function or functions,



(d) the said sensing means varying the subcarriers in a manner such that the receiver functions will have an apparent constant magnitude in the vicinity of the remote control transmitter.

SEPTEMBER 2, 1980

256,624

POCKET FOR JEANS OR THE LIKE

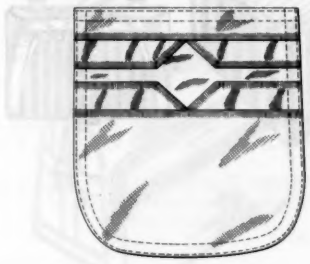
Martin Heinfling, Bayside, N.Y., assignor to Englishtown Sportswear, Ltd., New York, N.Y.

Filed Jun. 2, 1978, Ser. No. 911,732

Term of patent 14 years

Int. Cl. D2—*01*

U.S. Cl. D2—25



256,625

PANTS

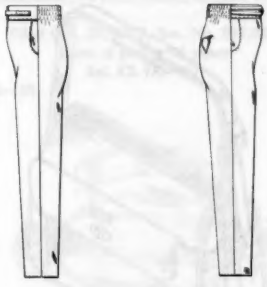
Kendall W. Scudder, and Barbara L. Scudder, both of 222 Linden St., Ft. Collins, Colo. 80521

Filed Jun. 15, 1978, Ser. No. 915,937

Term of patent 14 years

Int. Cl. D2—*02*

U.S. Cl. D2—28



256,626

HELMET FOR RACKETBALL

Morris J. Antonino, 1227 E. Ellery St., Fresno, Calif. 93710

Filed May 12, 1978, Ser. No. 905,240

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—232

256,627

SPORT SHOES

Wan Chan Lu, Miao Li Hsien, Taiwan, assignor to Jung Li Hsing Industry Co. I td.

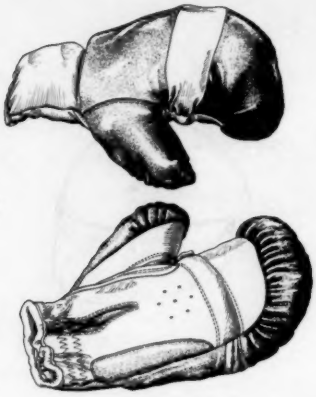
Filed Sep. i2, 1978, Ser. No. 941,595

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—311

256,628
BOXING GLOVE
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Sep. 28, 1978, Ser. No. 946,812
Term of patent 14 years
Int. Cl. D02—*06*
U.S. Cl. D2—361



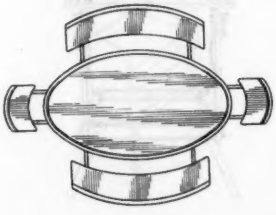
256,629
CROCHET HOOK
Bernard L. Keller, 41 Eagle La., Palm Harbor, Fla. 33563
Filed Jun. 30, 1978, Ser. No. 920,856
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D3—28

256,630
KNAPSACK COOLER
Thomas H. Maney, 614 Postfield Rd., Scottfield, Newark, Del. 19713
Filed Feb. 8, 1979, Ser. No. 10,229
Term of patent 14 years
Int. Cl. D3—*01*; D7—*07*
U.S. Cl. D3—32

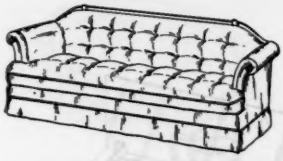
256,631
SHOULDER TOTE BAG
David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 30, 1979, Ser. No. 7,785
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48

256,632
SHOULDER TOTE BAG
David E. Workman, Evergreen, Colo., assignor to Samsonite Corporation, Denver, Colo.
Filed Jan. 30, 1979, Ser. No. 7,787
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—48

256,633
COMBINED TABLE AND MULTIPLE SEAT UNIT
Gordon W. Shumaker, St. Paul, Minn., assignor to Space Tables, Inc.
Filed Oct. 26, 1978, Ser. No. 955,028
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45



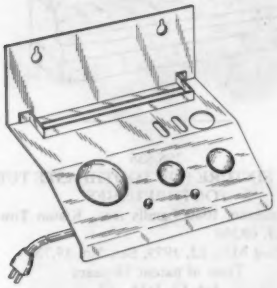
256,634
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Aug. 23, 1978, Ser. No. 936,025
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



256,635
BATHROOM FIXTURE FOR TOOTHPASTE TUBES AND TOOTHBRUSHES
Anthony A. Musiano, 1040 Landis Ave., Kiston Towers 10-D, Vineland, N.J. 08360
Filed Mar. 12, 1979, Ser. No. 19,759
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—91

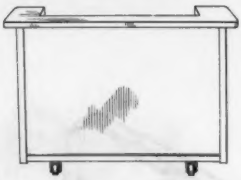
256,636
SUSPENDIBLE RECEPTACLE
Robert F. Leishman, 604 Longfield Ave., Sherwood, Ark. 72116
Filed Feb. 1, 1979, Ser. No. 8,243
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113

256,637
COMBINED RACK FOR HAIRDRESSING INSTRUMENTS OR THE LIKE AND ELECTRICAL CORD THEREFOR
Nicholas C. Chiklis, 60 Passaconway Dr., Dracut, Mass. 01826
Filed Mar. 23, 1978, Ser. No. 889,614
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125

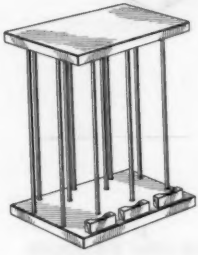


256,638
PHONEBOOTH
John B. Olson, and John S. Hickman, both of Milwaukee, Wis., assignors to Utility Products Co., Inc.
Filed Jan. 12, 1979, Ser. No. 3,047
Term of patent 14 years
Int. Cl. D6—*04*; D25—*03*
U.S. Cl. D6—130

256,639
MOBILE BAR
James C. Lee, III, and Norman K. Early, both of P.O. Box 58014, Birmingham, Ala. 35209
Filed Mar. 22, 1978, Ser. No. 889,621
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—144

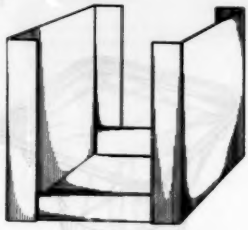


256,640
WINE RACK
Gardner W. Farwell, 1319 Hornblend #7, San Diego, Calif. 92109, and George A. Bernard, 6838 Via Estrada, La Jolla, Calif. 92037
Filed Sep. 22, 1978, Ser. No. 944,916
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—148

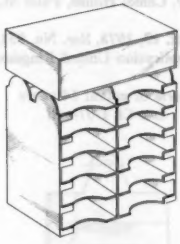


256,641
PORTABLE WORKBENCH
Peter H. Wilson, Sedgefield, England; Lorenzo E. Alessio, Civate, Italy, and Ronald P. Hickman, Jersey, Channel Islands, assignors to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1978, Ser. No. 886,208
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

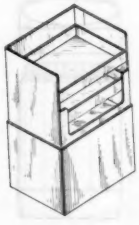
256,642
NEWSPAPER BIN
Robert C. Lovell, 725 N. Glendale Ave., Glendale, Calif. 91206
Filed Nov. 29, 1978, Ser. No. 964,804
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



256,643
TAPE RACK
William H. Johnson, 235 W. 66th St., Los Angeles, Calif. 90003
Filed Nov. 6, 1978, Ser. No. 958,150
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

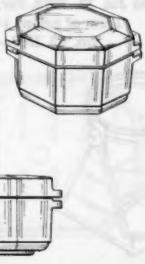


256,644
DISPLAY RECEPTACLE
Philip Marks, New York, N.Y., assignor to Advertising Displays Corporation, Englewood, N.J.
Filed Jan. 25, 1978, Ser. No. 872,199
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—186

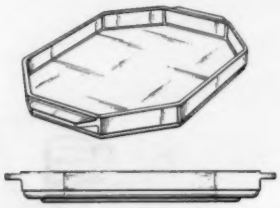


256,645
NOVELTY BEVERAGE MUG
Emmett J. Keough, 334 28th Street Dr. SE., Cedar Rapids, Iowa 52403
Filed Sep. 29, 1978, Ser. No. 947,250
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—9

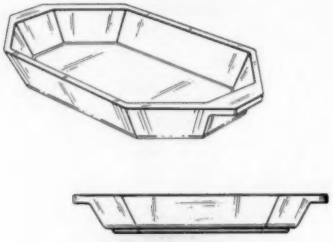
256,646
COVERED DISH
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 8, 1979, Ser. No. 18,807
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—18



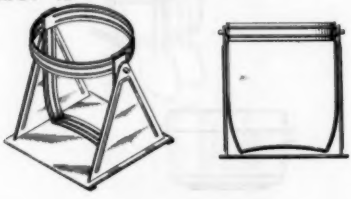
256,647
ROASTING PAN
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 8, 1979, Ser. No. 18,481
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—21



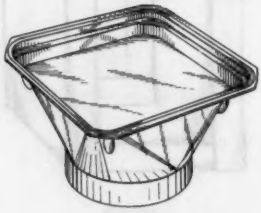
256,648
DISH
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 8, 1979, Ser. No. 18,810
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—21



256,649
DISPENSING HOLDER FOR A BOTTLE OR SIMILAR ARTICLE
Melvin Zerowin, 6041 Whitsett Ave., North Hollywood, Calif. 91606
Filed Jul. 17, 1978, Ser. No. 925,540
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—70



256,650
FOOD STORAGE AND DISPENSING DEVICE
Max Juster, Lombard, Ill., assignor to North American Paper Co., Chicago, Ill.
Filed Nov. 21, 1977, Ser. No. 853,801
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D7—76



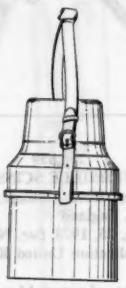
256,651
INSULATED JAR WITH LID
Tsoo-Hing Leung, and Philip Leung, both of Wei Yit Vacuum Flask Manufactory, Camel House, Palm St., Kowloon, Hong Kong
Filed Oct. 13, 1978, Ser. No. 951,136
Claims priority, application United Kingdom, Apr. 20, 1978, 984279/78
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—77

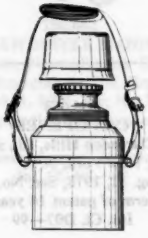
256,652

INSULATED JAR WITH LID

Tsoo-Hing Leung, and Philip Leung, both of Wei Yit Vacuum Flask Manufactory, Camel House, Palm St., Kowloon, Hong Kong

Filed Oct. 13, 1978, Ser. No. 951,137
Claims priority, application United Kingdom, Apr. 20, 1978, 994280/78
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—77



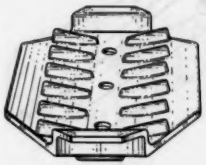


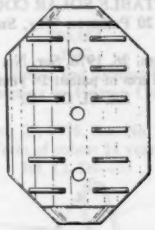
256,653

ROASTING RACK

David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 8, 1979, Ser. No. 18,805
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—94



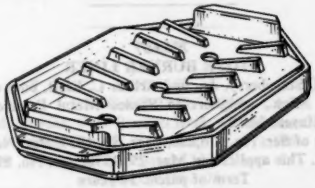


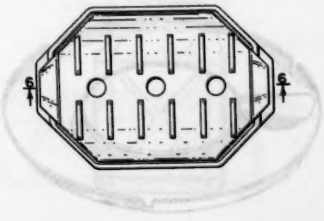
256,654

COMBINED ROASTING PAN AND RACK

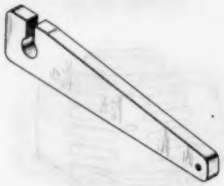
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 8, 1979, Ser. No. 18,483
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—96

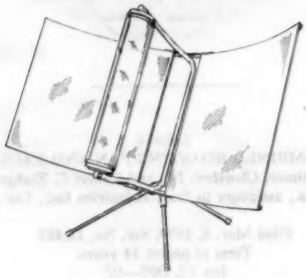




256,655
HOT OVEN RACK PULLER OR SIMILAR ARTICLE
Paul A. Lacey, Tarbell Hill Rd., Moriah, N.Y. 12960
Filed Jan. 31, 1979, Ser. No. 8,033
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—99

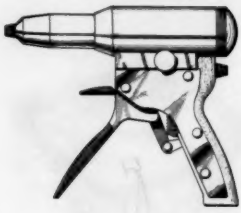


256,656
PORTABLE SOLAR COOKER
Albert F. Naccach, 20 Pamaron Way, Suite G, Novato, Calif. 94947
Filed Jan. 26, 1978, Ser. No. 872,593
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107



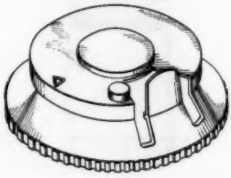
256,657
STOVE BURNER LINER
Warren H. Stansberry, Jr., and Arthur C. Kieft, both of Grand Haven, Mich., assignors to Stanco Metal Products, Inc., Grand Haven, Mich.
Division of Ser. No. 776,836, Mar. 14, 1977, Pat. No. Des. 250,081. This application Mar. 29, 1978, Ser. No. 891,474
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—136

256,658
RIVET GUN
John Ewig, Worcester, Mass., assignor to Parker Manufacturing Company, Worcester, Mass.
Filed Apr. 28, 1978, Ser. No. 900,999
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—61



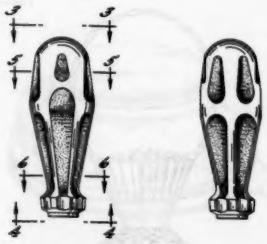
256,659
REVERSIBLE SCISSORS
Richard N. Hawkins, Rose Cottage, Preston, Woodleigh, Kingsbridge, Devon, England
Filed Aug. 25, 1978, Ser. No. 936,893
Claims priority, application United Kingdom, Mar. 3, 1978, 983605/78
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57

256,660
CAN OPENER
Carmen T. Mascia, Clarendon Hills, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Filed Aug. 31, 1978, Ser. No. 938,622
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—40

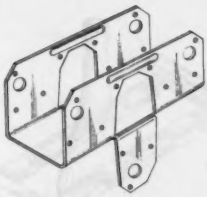


256,661
ADJUSTABLE MOUNTING FOR USE IN LAYING BUILDING SIDING MATERIAL
Michael K. Graham, 910 N. Fourth Ave. E., Newton, Iowa 50208
Filed Nov. 13, 1978, Ser. No. 959,696
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

256,662
SCREWDRIVER HANDLE
Horst W. Holland-Letz, Neustadt, Fed. Rep. of Germany, assignor to Felo-Werkzeugfabrik, Fed. Rep. of Germany
Filed Feb. 1, 1978, Ser. No. 874,275
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1977, 7726661
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83



256,663
POST AND BEAM CONNECTOR
Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.
Filed May 30, 1978, Ser. No. 910,427
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

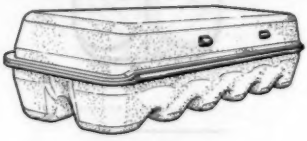


256,664
JUG
Robert P. Burrington, Saline, and Richard L. Platte, Ann Arbor, both of Mich., assignors to Hoover Universal, Inc., Saline, Mich.
Filed Oct. 25, 1978, Ser. No. 954,439
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40

256,665
JUG OR THE LIKE
Wayne M. Smythe, 6417 Bandini Blvd., Commerce, Calif. 90074
Filed Jan. 23, 1978, Ser. No. 871,306
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52

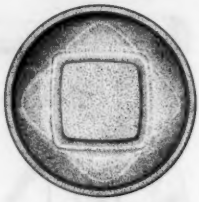
256,666
BOTTLE
Enrique Sardá, Box 9906, Saint Thomas, V.I. 00801
Filed Jun. 23, 1978, Ser. No. 918,574
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—72

256,667
EGG CARTON
Wayne Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Sherman Oaks, Calif.
Filed Aug. 29, 1977, Ser. No. 828,408
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—190

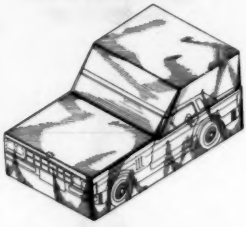


256,668
PACKAGING CONTAINER FOR FOODS
Christopher P. Amberg, and Norman L. Rousseau, both of Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 31, 1977, Ser. No. 846,955
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

256,669
PACKAGING CONTAINER FOR FOOD OR THE LIKE
Robert M. Mitchell, Norwalk, Conn., assignor to Lever Brothers Company, New York, N.Y.
Filed Dec. 27, 1977, Ser. No. 864,887
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220

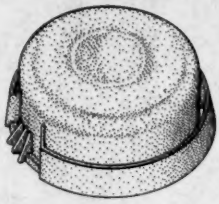


256,670
BOX
Darrell D. Fish, Timonium, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.
Filed Sep. 25, 1978, Ser. No. 945,556
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—196

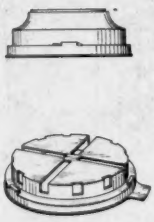


256,671
FLORAL BASKET
Roderic M. Koch, Evansville, Ind., assignor to Geroge Koch Sons, Inc., Evansville, Ind.
Filed Oct. 11, 1978, Ser. No. 950,269
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—246

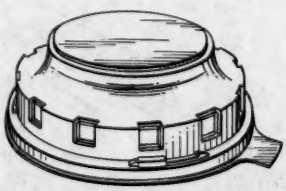
256,672
CLOSURE CAP
Reinhold Beck, Pfeffingen, Switzerland, assignor to Albert Obrist AG., Reinach, Switzerland
Filed May 2, 1977, Ser. No. 793,184
Claims priority, application Switzerland, Mar. 30, 1977, 10912877
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—254



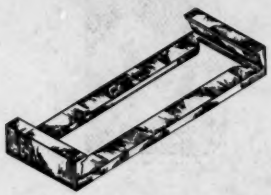
256,673
DISPENSING CAP
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Dec. 26, 1978, Ser. No. 972,848
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—281



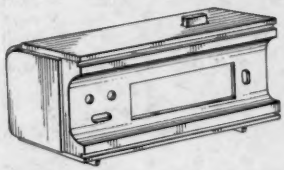
256,674
DISPENSING CAP
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Dec. 26, 1978, Ser. No. 972,854
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—281



256,675
ONE PIECE END PROTECTOR FOR AN INTEGRATED CIRCUIT PACKAGE
Terrence M. Lubsen, Sunnyvale, and Albert J. Hill, Santa Clara, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.
Filed Dec. 11, 1978, Ser. No. 968,493
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294

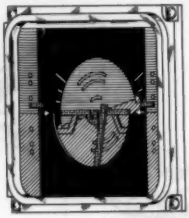


256,676
HOUSING FOR A DIGITAL CLOCK OR THE LIKE
David K. Haufe, Hinsdale, Ill., assignor to Sunbeam Corporation
Filed May 9, 1977, Ser. No. 794,904
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—1

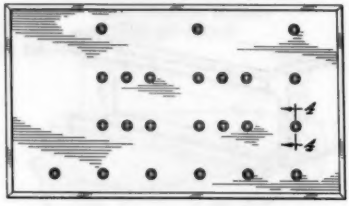


256,677
WRIST WATCH
Keizo Muramatsu, 2-30-9, Hatsudai, Shibuya-Ku, Tokyo, Japan
Filed Jul. 31, 1978, Ser. No. 929,437
Claims priority, application Japan, Jun. 20, 1978, 53-25417
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

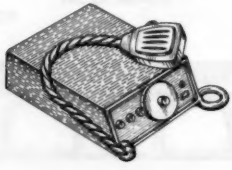
256,678
ATTITUDE DIRECTOR INDICATOR
Donald F. Schmidt, Cedar Rapids, Iowa, and Siegfried Knemeyer, Yellow Springs, Ohio, assignors to Rockwell International Corporation, Dallas, Tex.
Filed May 22, 1978, Ser. No. 908,025
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—67



256,679
CLOCK FACE
James G. Vaughan, 10507 Dupont Rd., Bloomington, Minn. 55431, and Robert W. Vaughan, 377 W. Adams St., #7, Manteno, Ill. 60950
Filed Oct. 25, 1978, Ser. No. 954,367
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—125

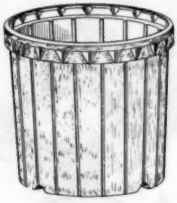


256,680
CB CHARM
Virginia L. Steele, P.O. Box 417, Clinton, Wash. 98236
Filed Jun. 7, 1978, Ser. No. 913,400
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—81

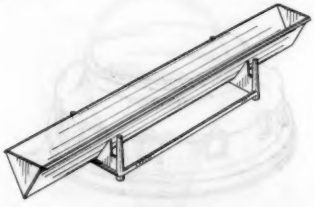


256,681
BEADED CANE DECORATION
Stephanie J. Green, 22323 Erwin St., Woodland Hills, Calif. 91367
Filed Mar. 2, 1978, Ser. No. 882,836
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—121

256,682
PLANT CONTAINER
Norman Lee, East Aurora, N.Y., and Thomas E. Douglas, Reidsville, N.C., assignors to Zarn, Inc., Reidsville, N.C.
Filed Jul. 5, 1979, Ser. No. 54,711
Term of patent 14 years
Int. Cl. D11—*02*; D9—*03*
U.S. Cl. D11—152



256,683
RECEPTACLE FOR PROPAGATING THE GROWTH OF YOUNG PLANTS
Leonard G. Merritt, Watford, England, assignor to Merrittstyle Products Company, Hertfordshire, England
Filed Jul. 17, 1979, Ser. No. 58,251
Claims priority, application United Kingdom, Jan. 24, 1979, 988230/79
Term of patent 14 years
Int. Cl. D11—*02*; D30—*03*
U.S. Cl. D11—156

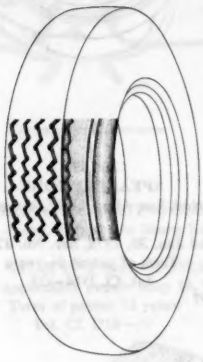


256,684

TIRE

Loran C. Lopp, Jr., Wadsworth, Ohio, assignor to The Goodyear Tire & Rubber Company

Filed Dec. 12, 1977, Ser. No. 860,003
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143

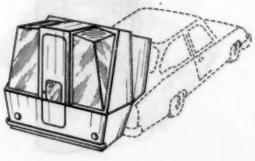


256,685

VEHICLE-SUPPORTED SHELTER

William N. Whitley, 19315 Shaker Blvd., and James M. Whitley, 2963 Morley, both of Shaker Heights, Ohio 44122

Filed Feb. 22, 1978, Ser. No. 880,319
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

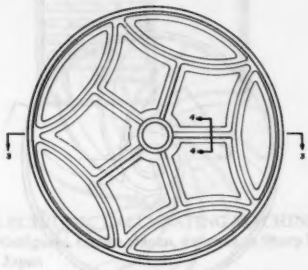


256,686

BICYCLE WHEEL OR SIMILAR ARTICLE

Lawrence F. Zielinski, Toledo, Ohio, assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 906,322, May 15, 1978, abandoned. This application Jun. 6, 1979, Ser. No. 45,982
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



256,687

BICYCLE WHEEL OR SIMILAR ARTICLE

Lawrence F. Zielinski, Toledo, Ohio, assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 906,323, May 15, 1978, abandoned. This application Jun. 6, 1979, Ser. No. 45,983
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

256,688

BICYCLE WHEEL OR SIMILAR ARTICLE

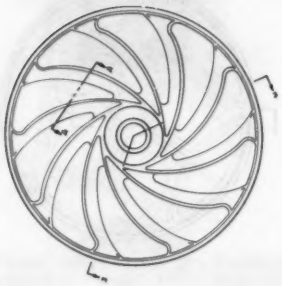
Lawrence F. Zielinski, Toledo, Ohio, assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 906,318, May 15, 1978, abandoned. This application Jun. 6, 1979, Ser. No. 45,984

Term of patent 14 years

Int. Cl. D12—*16*

U.S. Cl. D12—205



256,689

AUTOMATIC TELEPHONE ANSWERING DEVICE

Lawrence G. McCain, Beverly Hills, Calif., assignor to Answerex, Inc., Los Angeles, Calif.

Filed Jun. 9, 1978, Ser. No. 914,010

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—04

256,690

TURNTABLE FOR RECORD PLAYER

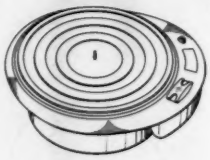
Takeshi Matumaru, Tokyo, Japan, assignor to Nippon Columbia Co. Ltd., Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,392

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—17



256,691

SPEAKERPHONE

Hans R. Camenzind, Los Altos, Calif., assignor to Tridar, Sunnyvale, Calif.

Filed Jan. 30, 1978, Ser. No. 873,164

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—57

256,692

PUBLIC TELEPHONE SET ENCLOSURE

Donald M. Genaro, Haworth; Thomas J. Kelly, Middletown, both of N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1978, Ser. No. 884,604

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—61

256,693

SUNGLASSES

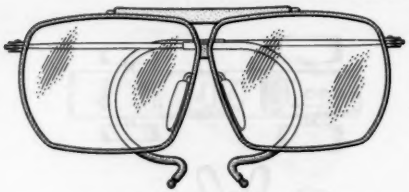
Francis F. Eaton, 43 W. 16th St., #2A, New York, N.Y. 10011

Filed Jan. 10, 1979, Ser. No. 2,407

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—77



256,694

ELECTRONIC CALCULATING MACHINE

Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Nov. 8, 1978, Ser. No. 958,944

Claims priority, application Japan, May 16, 1978, 53/20067

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—7

256,695

ELECTRONIC CALCULATING MACHINE

Masafumi Yamagami, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Nov. 8, 1978, Ser. No. 958,945

Claims priority, application Japan, May 16, 1978, 53/20066

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—7

256,696

ELECTRONIC CALCULATING MACHINE

Matafumi Ikeda, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Nov. 8, 1978, Ser. No. 958,893

Claims priority, application Japan, May 9, 1978, 53/18788

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—7

256,697

ELECTRONIC CALCULATING MACHINE

Seiichiro Nishiguchi, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Nov. 8, 1978, Ser. No. 958,895

Claims priority, application Japan, May 13, 1978, 53/19600

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D18—7

256,698

ELECTRONIC CALCULATING MACHINE

Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan

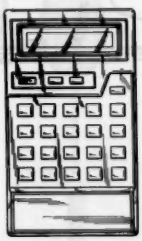
Filed Nov. 20, 1978, Ser. No. 962,149

Claims priority, application Japan, May 31, 1978, 53/22710

Term of patent 14 years

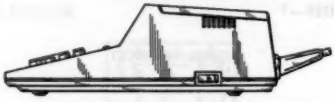
Int. Cl. D18—*01*

U.S. Cl. D18—7



256,699
ELECTRONIC CALCULATING MACHINE
Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan
Filed Nov. 20, 1978, Ser. No. 962,150
Claims priority, application Japan, Nov. 24, 1978, 53/21477
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

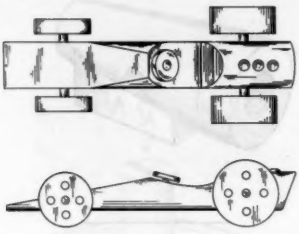
256,700
ELECTRONIC CALCULATING MACHINE
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan
Filed Dec. 4, 1978, Ser. No. 965,731
Claims priority, application Japan, Jun. 13, 1978, 53/24541
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7



256,701
TOY MUSIC BOX
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Taira Hanashima, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1978, Ser. No. 936,969
Claims priority, application Japan, May 9, 1978, 53/18687
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

256,702
TOY MUSIC BOX
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Hiroaki Matsuda, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Aug. 25, 1978, Ser. No. 936,970
Claims priority, application Japan, May 9, 1978, 53/18688
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64

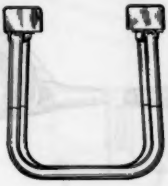
256,703
TOY CAR
C. Johnny Munn, 69 S. Taft Hill Rd., Fort Collins, Colo. 80521
Continuation of Ser. No. 789,918, Apr. 22, 1977, abandoned.
This application Jun. 4, 1979, Ser. No. 45,516
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



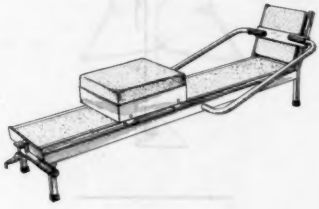
256,704
STUFFED TOY ANIMAL FIGURE
Dollene G. Freeland, 15612 Gridley Rd., Norwalk, Calif. 90650
Filed Dec. 13, 1978, Ser. No. 968,751
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—148

256,705
SIMULATIVE TUMBLING TOY
Shinroku Nakao, Yokohama; Yoshiyasu Ishii, and Susumu Matsumoto, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Sep. 7, 1978, Ser. No. 940,237
Claims priority, application Japan, May 26, 1978, 53/21523
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—159

256,706
EXERCISE STOOL OR SIMILAR ARTICLE
Daniel A. Gartin, 916 Barnegat La., Mantoloking, N.J. 08738
Filed Dec. 4, 1978, Ser. No. 966,462
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191



256,707
PHYSICAL EXERCISER
Keith MacLaren-Taylor, 360 Roan Close, Riverclub Ext. 3, Sandton 2149, South Africa
Filed Dec. 29, 1978, Ser. No. 974,629
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—191



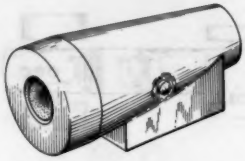
256,708
BADMINTON RACKET
Kun N. Lo, 7-1, Lane 246, Sec. 3, Chung-Shan Rd., Tan-Tzu, Hsiang, Taiwan
Filed Aug. 18, 1978, Ser. No. 935,075
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

256,709
WOOD TYPE GOLF CLUB HEAD OR SIMILAR ARTICLE
Walter L. Reid, Jr.; Ralph L. Delano, both of Mattapoisett, and John W. Jepson, Marion, all of Mass., assignors to Acushnet Company, New Bedford, Mass.
Filed Nov. 25, 1977, Ser. No. 854,603
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214

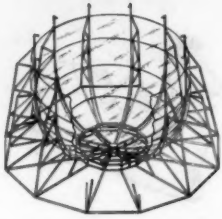
256,710
GOLF PUTTING AID ATTACHMENT
James L. Dusto, 145 Flamingo Dr., Beaconsfield, Quebec, Canada (H9W 2T3)
Filed Jan. 10, 1978, Ser. No. 868,469
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—221

256,711
SELF-PROPELLED SKATEBOARD
Anthony Farque, 1108 N. Washington, Fayetteville, Ark. 72701
Continuation-in-part of Ser. No. 792,701, May 2, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,711
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

256,712
POWERED POOL CUE CHALKER
Todd E. Bushberger, 10139 W. Forest Home Ave., Hales Corners, Wis. 53130
Filed Nov. 1, 1978, Ser. No. 956,498
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232

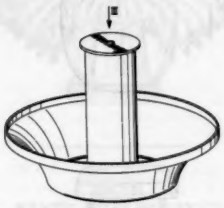


256,713
SKATEBOARD RAMP BOWL
Douglas B. Firestone, 9389 F Dowdy Dr., San Diego, Calif. 92126
Filed Jan. 10, 1978, Ser. No. 868,344
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—242

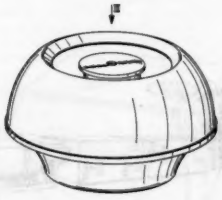


256,714
FISHING ROD GUIDE
Ryuichi Ohmura, No. 19-3, Minami-cho,, Shizuoka-shi, Shizuoka-ken, Japan
Filed Mar. 8, 1978, Ser. No. 884,724
Claims priority, application Japan, Sep. 12, 1977, 52-36408
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

256,715
FLY-TRAP
Jean-Marie Gombert, Mignaloux-Beauvoir, and Yves Joyaux, Poitiers, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Sep. 5, 1978, Ser. No. 939,501
Claims priority, application Switzerland, Mar. 9, 1978, 109749/78
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—19



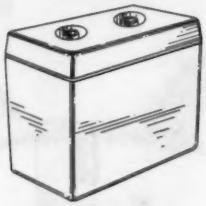
256,716
FLY-TRAP
Jean-Marie Gombert, Mignaloux-Beauvoir, and Yves Joyaux, Poitiers, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Filed Sep. 5, 1978, Ser. No. 939,502
Claims priority, application Switzerland, Mar. 9, 1978, 109749/78
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—19



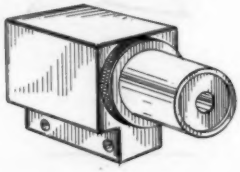
256,717
INSECT TRAP
James W. Seidenberger, Royersford, Pa., assignor to J. T. Baker Chemical Company, Phillipsburg, N.J.
Filed Mar. 5, 1979, Ser. No. 17,187
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

256,718
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, No. 19-3, Minami-cho, Shizuoka-shi, Shizuoka-ken, Japan
Filed Jun. 14, 1978, Ser. No. 916,006
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

256,719
PORTABLE WATER PURIFIER
Jack G. Rose, 1935 SE. Washington, Milwaukee, Oreg. 97222
Filed Feb. 13, 1978, Ser. No. 877,421
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



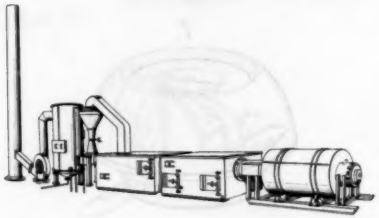
256,720
FLUID NOZZLE FOR HIGH-VELOCITY FLUID STREAMS
John D. Watson, 906 E. Harmony La., Fullerton, Calif. 92631
Filed May 15, 1978, Ser. No. 905,644
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



256,721
CLOSURE CAP
George E. Boller, and Richard J. Renk, both of Winona, Minn., assignors to Gladys D. Miller
Filed Aug. 4, 1977, Ser. No. 821,716
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—41

256,722
TOILET
Charles L. Sargent; Frank T. Sargent, and Arthur W. Henke, all of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.
Filed Nov. 22, 1978, Ser. No. 963,020
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—67

256,723
WASTE INCINERATION INSTALLATION
Wayne Wills, North Palm Beach, Fla., assignor to The United Corporation, Topeka, Kans.
Filed Dec. 30, 1977, Ser. No. 865,886
Term of patent 14 years
Int. Cl. D23—*99*; D25—*03*
U.S. Cl. D23—85



256,724

HEAT EXCHANGER GRID FOR AN ELECTRIC HEATER

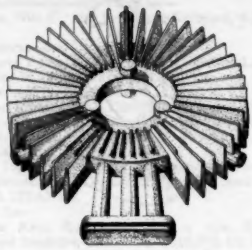
Alben C. Boggs, Pittsburgh, and John C. Stover, Verona, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Aug. 9, 1976, Ser. No. 712,762

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—136



256,725

VENTILATOR HOUSING

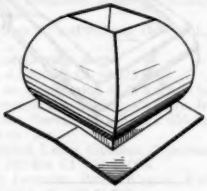
Sam Stahl, 2201 Chamberlain, Houston, Harris County, Tex. 77093

Filed Nov. 6, 1978, Ser. No. 957,937

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—153



256,726

HOUSING FOR APPARATUS FOR DETERMINING THE MELTING POINT OF MATERIALS

Martin Meuli, Oetwil, and Josef Tresch, Greifensee, both of Switzerland, assignors to Mettler Instrumente AG, Greifensee, Switzerland

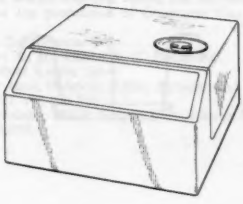
Division of Ser. No. 697,730, Jun. 16, 1976, Pat. No. D. 246,857.

This application Jul. 11, 1977, Ser. No. 814,784

Term of patent 14 years

Int. Cl. D24—*01*

U.S. Cl. D24—8



256,727

CAPSULE FOR TWO-COMPONENT PREPARATIONS

Bo I. B. Borg, Södertälje; Arne T. Eek, Trosa, and Axel B. Persson, Lund, all of Sweden, assignors to Astra Läkemedel AB, Södertälje, Sweden

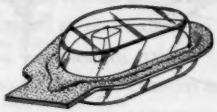
Filed Dec. 27, 1977, Ser. No. 864,831

Claims priority, application Sweden, Jul. 4, 1977, 771467

Term of patent 14 years

Int. Cl. D24—*02*; D9—*04*

U.S. Cl. D24—17



256,728

REVERSIBLE ORTHOPEDIC PILLOW HAVING EAR AND EYE RELIEF AREAS

Katherine E. Allen, 741 Calle de los Amigos, Santa Barbara, Calif. 93105

Filed Apr. 14, 1978, Ser. No. 896,331

Term of patent 7 years

Int. Cl. D6—*09*; D24—*99*

U.S. Cl. D24—36

256,729

DECORATIVE WINDOW MUNTIN, OR THE LIKE

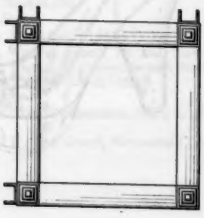
David T. Carlson, 923 S. Cardiff, Anaheim, Calif. 92805

Filed Jul. 17, 1978, Ser. No. 925,017

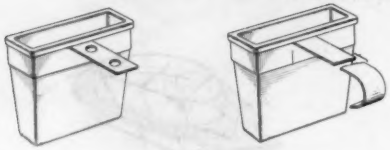
Term of patent 14 years

Int. Cl. D25—*02*

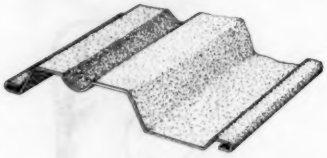
U.S. Cl. D25—52



256,730
PAINT BRUSH HOLDER FOR MOUNTING ON A LADDER STEP, RUNG, OR THE LIKE
James M. Hester, 7911 Ocean View St., Whittier, Calif. 90602
Filed Nov. 21, 1977, Ser. No. 853,105
Term of patent 14 years
Int. Cl. D6—*99, 04*
U.S. Cl. D25—68



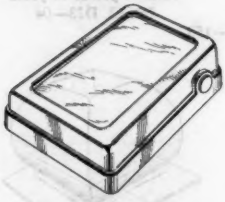
256,731
SHEET PILING
Jens H. Madsen, Guelph, Canada, assignor to Armco Inc, Middletown, Ohio
Filed Sep. 27, 1978, Ser. No. 946,161
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



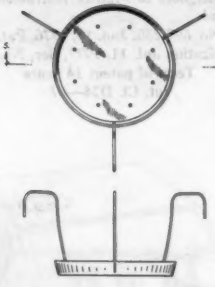
256,732
PIPE
Jack D. Dollen, 416 S. Clare Ave., Harrison, Mich. 48625
Filed Jan. 31, 1979, Ser. No. 7,968
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—04

256,733
ASH TRAY
Frank Ventura, 9932 Lindo Lake Pl., Lakeside, Calif. 92040
Filed Feb. 2, 1979, Ser. No. 8,923
Term of patent 3½ years
Int. Cl. D27—*03*
U.S. Cl. D27—22

256,734
HEATED PET WATER BED
Michael L. Riley, 127 River Woods La., Burnsville, Minn. 55337
Filed Feb. 16, 1978, Ser. No. 878,300
Term of patent 14 years
Int. Cl. D30—*06*
U.S. Cl. D30—41



256,735
TOILET TRAINER FOR CATS
Leopoldine R. Denk, 30847 Mayflower, Roseville, Mich. 48066
Filed Mar. 8, 1979, Ser. No. 18,846
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



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TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Chance Company: *See*—
Mahieu, William R.; and Popeck, Charles A., 4,220,941, Cl. 337-250.000.

A/S Raufoss Ammunisjonsfabrikker: *See*—
Tommeraas, Nils C.; and Legernes, Kolbjorn, 4,219,938, Cl. 33-199.00R.

Abbott Laboratories: *See*—
Hixson, Harry F., Jr.; Green, Billy J.; Cummins, Laurence M.; and Cole, John W., 4,220,598, Cl. 260-397.100.
Kloss, John; and Nadzan, Alex M., 4,220,756, Cl. 536-17.00R.
McEachern, Richard D., 4,220,850, Cl. 250-204.000.
Sato, Moriyuki; and Mori, Yasuki, 4,220,755, Cl. 536-17.00R.
Walters, Roland L.; and Heitmann, Wayne R., 4,220,801, Cl. 562-468.000.

Abe, Katsuo; Taguchi, Noriyuki; Sugishita, Nobuyuki; and Isogai, Tokio, to Hitachi, Ltd. Dielectric paste for thick film capacitor. 4,220,547, Cl. 252-63.500.

Abe, Ryutaro: *See*—
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.

Abeille, Jean; Coeuillet, Jacques; Coutenceau, Francois; and Grandfils, Claude, to Thomson-CSF. Hydraulic servo-control system with out-of-balance load. 4,220,004, Cl. 60-413.000.

Abele, Robert J.: *See*—
Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 4,220,159, Cl. 128-639.000.

ACF Industries, Incorporated: *See*—
Wempe, Richard J.; and Dumser, Paul J., 4,220,097, Cl. 105-360.000.

Ackley, Richard H.: *See*—
Carley, Earl P.; and Ackley, Richard H., 4,220,496, Cl. 156-174.000.

Adams, Elvis E., to Baxter Travenol Laboratories, Inc. Injection site having thermoplastically sealed injection port. 4,219,912, Cl. 128-214.00G.

Adams, Robert T.: *See*—
Pappas, Dennis G.; Baum, Matthew C.; Small, Samuel N.; Adams, Robert T.; and Freedman, Robert P., 4,220,907, Cl. 322-3.000.

Adrian, Donald J.: *See*—
Whiteley, Thomas B.; and Adrian, Donald J., 4,220,952, Cl. 343-7.0PF.

Aerojet-General Corporation: *See*—
Beichel, Rudi, 4,220,001, Cl. 60-225.000.

Agence Nationale de Valorisation de la Recherche: *See*—
Audibert, Francoise; Chedid, Louis; Choay, Jean; Lederer, Edgar; and Lefrancier, Pierre, 4,220,637, Cl. 424-88.000.

AGFA-Gevaert A.G.: *See*—
Hofmann, Wilfried; Luder, Gunther; Oppermann, Ruth; and Moll, Adolf H., 4,220,404, Cl. 353-27.00R.
Stemme, Otto; Lermann, Peter; Wagner, Karl; and Engelsmann, Dieter, 4,220,405, Cl. 354-21.000.
Stemme, Otto; Wagner, Karl; Lermann, Peter; Schroder, Rolf; and Utschig, Peter, 4,220,407, Cl. 354-126.000.

AGFA-Gevaert N.V.: *See*—
Janssens, Wilhelmus; Heugebaert, Frans C.; and Kokelenberg, Hendrik E., 4,220,710, Cl. 430-353.000.

Agrawal, Suphal P.: *See*—
Weisert, Edward D.; and Agrawal, Suphal P., 4,220,276, Cl. 228-118.000.

Agyagos, Ferenc I. Exerciser device. 4,220,329, Cl. 272-146.000.

Ahi Operations Limited: *See*—
Stewart, James L.; and Owers, Raymond G., 4,219,981, Cl. 52-478.000.

Ahmed, Adel A. A., to RCA Corporation. Quasi-linear amplifier with feedback-controlled idling currents. 4,220,930, Cl. 330-270.000.

Ahmed, Myrna M.: *See*—
Ahmed, Nazeer; and Ahmed, Myrna M., 4,220,029, Cl. 72-262.000.

Ahmed, Nazeer; and Ahmed, Myrna M. Continuous extrusion machine and method of continuous extrusion. 4,220,029, Cl. 72-262.000.

Ahnell, Joseph E., to Johnston Laboratories, Inc. Apparatus for and method of detection of significant bacteriuria in urine samples through measurement of head space gas oxygen consumption in a closed-vial system. 4,220,715, Cl. 435-34.000.

Aida, Ko; Uchida, Kinya; Kawada, Izumi; and Ito, Hideichi, to Aida, Ko. Process for the production of Coenzyme Q_{10}. 4,220,719, Cl. 435-133.000.

Air Conditioning Corporation: *See*—
Smith, Robert A., Jr., 4,220,032, Cl. 72-389.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ban, Hiroshi; Hori, Hideichi; Kudo, Ryoichi; and Yoshida, Akio, 4,220,233, Cl. 192-[illegible].200.
Kasahara, Takahiko; Shichi, Shigeharu; and Suito, Senji, 4,220,103, Cl. 112-260.000.
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,220,059, Cl. 74-865.000.

Aizawa, Takeo: *See*—
Sugibuchi, Shigeyoshi; Hiramatsu, Mitsuo; and Aizawa, Takeo, 4,220,705, Cl. 430-294.000.

Akiyama, Shinichi; and Yamamoto, Haruhisa, to Nippon Zeon Co. Ltd. Process for the preparation of acrylic acid. 4,220,802, Cl. 562-535.000.

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Nilsson, Ake, 4,220,093, Cl. 102-212.000.

Akzona Incorporated: *See*—
Anastasi, James; and Redmerski, Thomas S., 4,220,807, Cl. 174-36.000.
van der Vies, Johannes, 4,220,599, Cl. 260-397.400.

Aladdin Industries, Incorporated: *See*—
Frazier, Albert A., 4,220,462, Cl. 65-153.000.

Aladiev, Ivan T.; Voskresensky, Kirill D.; Gukov, Gennady P.; Saperov, Evgeny V.; and Fardzinov, Valery K. Apparatus for realization of rock exploitation method based on thermodynamic cycles utilizing in situ energy source. 4,220,202, Cl. 166-57.000.

Albany International Corporation: *See*—
Coplan, Myron J.; Beale, John H.; and Davis, Robert B., 4,220,489, Cl. 156-73.600.

Albert Rolland S.A.: *See*—
Laforest, Jacqueline, 4,220,794, Cl. 549-77.000.

Alberts, Heinrich: *See*—
Mietzsch, Fritz; Rudolph, Hans; Wolfers, Heinrich; and Alberts, Heinrich, 4,220,742, Cl. 526-209.000.

Albright, D. Janine. Pet-handbag carrier combination. 4,220,119, Cl. 119-19.000.

Alkasab, Kalil A. Periodic solar collector. 4,220,135, Cl. 126-417.000.

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Kawamoto, Hirohisa; and Allen, Elmer L., Jr., 4,220,915, Cl. 324-58.00A.

Allen, Neil W., to Standard Oil Company (Indiana). Seafloor diverter. 4,220,207, Cl. 166-367.000.

Allen, Ralph S., III. Partially disassemblable traction sling. 4,220,147, Cl. 128-75.000.

Alles, Harold G., to Bell Telephone Laboratories, Incorporated. Peripheral processor multifunction timer for data processing systems. 4,220,990, Cl. 364-200.000.

Allfast, Inc.: *See*—
Luhm, Ralph R., 4,219,924, Cl. 29-512.000.

Allied Chemical Corporation: *See*—
DiPaola, Donald A., 4,220,294, Cl. 242-107.40A.
Preziosi, Anthony F.; Yee, Kwok C.; and Baughman, Ray H., 4,220,747, Cl. 526-285.000.

Allis-Chalmers Corporation: *See*—
Hill, Donald J., 4,219,990, Cl. 56-14.200.
Johansen, Roy W.; and Haupt, Robert C., 4,220,372, Cl. 301-1.000.

Alloway Trust Limited: *See*—
Nobbs, John W., 4,220,335, Cl. 273-73.00R.

Alt, Paul M.; and Sahni, Omesh, to International Business Machines Corporation. Electro-optically matrix-addressed electroluminescence display with memory. 4,221,002, Cl. 365-111.000.

Amafilter BV: *See*—
Dosoudil, Martin, 4,220,536, Cl. 210-325.000.

American Cyanamid Company: *See*—
Kruska, Lothar H.; Hanstein, Friedrich; and Owen, Haven T., 4,219,910, Cl. 24-263.0SB.
Kuo, Joseph S., 4,220,717, Cl. 435-101.000.
Pfeiffer, Ronald E.; and Roberts, Robert W., 4,220,616, Cl. 264-206.000.
Pfeiffer, Ronald E.; and Peacher, Stanley E., 4,220,617, Cl. 264-206.000.
Zweig, Arnold; and Hoffman, Arthur K., 4,220,640, Cl. 424-175.000.

American Optical Corporation: *See*—
Kantorski, Joseph W., 4,220,038, Cl. 73-1.00B.

American Safety Equipment Corporation: *See*—
Henderson, Cyril; Hollowell, William; and Close, Albert R., 4,220,355, Cl. 280-804.000.

AMF Incorporated: *See*—
Stanford, Arthur, 4,220,065, Cl. 83-873.000.

Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, to Elfab Corporation. Electrical connector and method of fabrication and assembly. 4,220,393, Cl. 339-221.00M.

AMP Incorporated: *See*—
Clark, Richard P.; and Zimmerman, Gary L., 4,220,384, Cl. 339-59.00M.
Cobaugh, Robert F.; and Graeff, Norwood C., 4,220,390, Cl. 339-97.00R.

Johnson, Keith, Jr., 4,219,913, Cl. 29-33.00M.
Ritchie, Leon T.; and Woratyla, John A., 4,220,382, Cl. 339-17.0LM.
Scheingold, William S.; and Youngfleish, Frank C., 4,220,383, Cl. 339-17.0CF.

AMSTED Industries Incorporated: *See*—
Reicher, Harold J.; and Hepler, Leslie M., 4,220,300, Cl. 246-169.00A.

Anastasi, James; and Redmerski, Thomas S., to Akzona Incorporated. Transmission cable. 4,220,807, Cl. 174-36.000.

Andersen, Leonard M. Gelatinous coating for arc welding and method for underwater welding. 4,220,487, Cl. 148-24.000.

Anderson, Harry E.; and Heasley, Raymond E. In-line material handling system. 4,220,318, Cl. 266-49.000.

Anderson, Harvey L., Jr. Two way side dump bucket attachment for front end loader. 4,220,438, Cl. 414-705.000.

Anderson, Olof V., to Anson Incorporated. Combined clasp and tie slide. 4,219,909, Cl. 24-49.00R.

Anderson, Paul L.; and Paolella, Nicholas A., to Sandoz, Inc. 1-Phenylpyrazole derivatives. 4,220,792, Cl. 548-378.000.

Ando, Hiroyuki: *See*—
Umeda, Haruhiko; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Endo, Naotaka, 4,220,352, Cl. 280-708.000.

Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, to Hitachi, Ltd. Directly heated cathode for electron tube. 4,220,891, Cl. 313-345.000.

Andrews, H. David, to Star Packaging Corporation. Bagging apparatus. 4,219,989, Cl. 53-572.000.

Anquetil, Jean-Pierre; Deflin, Michel; Clement, Jean-Claude; and Neel, Emmanuel E. A. Spinel dehydrogenation catalyst. 4,220,560, Cl. 252-468.000.

Anson Incorporated: *See*—
Anderson, Olof V., 4,219,909, Cl. 24-49.00R.

Anstett, Edgar P. Nailing strip for nails to be driven therefrom. 4,220,070, Cl. 85-49.000.

Antell, George R., to International Standard Electric Corporation. Fiber optic switch. 4,220,396, Cl. 350-96.150.

Antos, George J., to UOP Inc. Hydrocarbon dehydrocyclization with a superactive multimetallic catalytic composite. 4,220,521, Cl. 208-139.000.

Antos, George J., to UOP Inc. Attenuated superactive multimetallic catalytic composite. 4,220,558, Cl. 252-441.000.

Aoyama, Syunichi, to Nissan Motor Company, Limited. Hydraulic valve lifter. 4,220,122, Cl. 123-90.550.

Apel, Willy: *See*—
Staab, Joachim; Apel, Willy; and Wolf, Heinz, 4,220,415, Cl. 356-433.000.

Apt Corporation: *See*—
Kampmann, Frank S., 4,220,817, Cl. 179-1.00D.

Arai, Atsuaki: *See*—
Furutachi, Nobuo; Nakamura, Kotaro; Arai, Atsuaki; Yamada, Minoru; and Shiba, Keisuke, 4,220,470, Cl. 430-387.000.

Arai, Minoru; and Baba, Akio, to Tokyo Print Industry Co., Ltd. Printed wiring board. 4,220,810, Cl. 174-68.500.

Arima, Shizuo: *See*—
Chiba, Yasutsune; Arima, Shizuo; Suzuki, Shoji; and Saitoh, Masayuki, 4,220,910, Cl. 323-19.000.

Armco Inc.: *See*—
Schumacher, William J.; and Tanczyn, Harry, 4,220,689, Cl. 428-558.000.

Armstrong Cork Company: *See*—
Brossman, William C.; McElhaney, Joseph G.; and Rooney, James H., III, 4,220,115, Cl. 118-684.000.

Armstrong, Michael P.; and O'Brian, Rodney W., to Coal Industry (Patents) Limited. Sizing screens and feeder devices therefor. 4,220,526, Cl. 209-240.000.

Arndt, Henry C.: *See*—
Kluender, Harold C.; and Arndt, Henry C., 4,220,795, Cl. 560-118.000.

Arnold, Fred E.: *See*—
Reinhardt, Bruce A.; and Arnold, Fred E., 4,220,750, Cl. 528-172.000.

Aro Corporation, The: *See*—
Brandenberg, Karl A., 4,220,361, Cl. 285-323.000.

Aronsson, Olle; Frank, Kjell; and Friden, Lars, to ASEA Aktiebolag. Electrical vehicle traction equipment. 4,220,902, Cl. 318-434.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kimura, Michio; Izawa, Nobuyuki; and Sakuma, Nobuaki, 4,220,088, Cl. 102-28.00R.
Matsuzaki, Kazuhiko; and Masamoto, Junzo, 4,220,740, Cl. 525-398.000.
Ohmura, Kaoru; Sasaguri, Kiichiro; and Toyomoto, Kazuo, 4,220,707, Cl. 430-325.000.

Asami, Ken: *See*—
Yasui, Toshio; Naito, Motoharu; and Asami, Ken, 4,220,871, Cl. 307-10.00R.

Asano, Masuyuki; and Omuro, Shojiro, to Mitsubishi Jukogyo Kabushiki Kaisha. Drive-frame support mechanism for force motor. 4,220,878, Cl. 310-13.000.

Asanuma, Tadashi: *See*—
Tanaka, Takao; Asanuma, Tadashi; Shiomura, Tetsunosuke; and Ito, Akira, 4,220,745, Cl. 526-125.000.

ASEA Aktiebolag: *See*—
Aronsson, Olle; Frank, Kjell; and Friden, Lars, 4,220,902, Cl. 318-434.000.
Sommarlund, Stanley, 4,220,615, Cl. 264-174.000.
Widehn, Ake, 4,220,037, Cl. 73-1.00B.

Asta-werke Aktiengesellschaft, Chemische Farik: *See*—
Brock, Norbert, 4,220,660, Cl. 424-315.000.

Aston, David T.: *See*—
Aston, Raymond; and Aston, David T., 4,220,420, Cl. 405-104.000.

Aston, Raymond; and Aston, David T., to Ham Baker & Company Limited. Sealing means, primarily for a sluice gate. 4,220,420, Cl. 405-104.000.

Atal, Bishnu S., to Bell Telephone Laboratories, Incorporated. Residual excited predictive speech coding system. 4,220,819, Cl. 179-1.0SA.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Steinwart, Johannes; and Bauder, Armin, 4,220,129, Cl. 123-457.000.

Audibert, Francoise; Chedid, Louis; Choay, Jean; Lederer, Edgar; and Lefrancier, Pierre, to Agence Nationale de Valorisation de la Recherche. Water soluble agents effective as immunological adjuvants for stimulating in the host the immune response to various antigens and compositions, notably vaccines containing said water soluble agents. 4,220,637, Cl. 424-88.000.

Austin, Oliver K., to Phillips Petroleum Company. Carbon black reactor with interchangeable refractory ceramic protective liner elements. 4,220,624, Cl. 422-150.000.

Austin, William R., to Singer Company, The. Electrical signal converter usable in triangular waveform generation. 4,220,927, Cl. 328-181.000.

Automatic Steam Products Corporation: *See*—
Miranker, Samuel, 4,219,948, Cl. 38-10.000.

Automobiles Peugeot: *See*—
Mauboussin, Joel, 4,220,047, Cl. 73-313.000.

Automotive Products Limited: *See*—
Hodkinson, Harold, 4,220,374, Cl. 303-6.00C.
Young, Alastair J., 4,220,007, Cl. 60-550.000.

Awano, Takeshi: *See*—
Maekawa, Naozane; and Awano, Takeshi, 4,220,353, Cl. 280-801.000.

Axel Johnson Corporation: *See*—
Lynch, C. Thomas, 4,220,314, Cl. 251-307.000.

Azuchi, Yukihiro: *See*—
Yamamoto, Takami; and Azuchi, Yukihiro, 4,220,980, Cl. 361-293.000.

B. Heller & Company: *See*—
Wistreich, Hugo E.; and Olson, Dennis G., 4,220,668, Cl. 426-266.000.

Baba, Akio: *See*—
Arai, Minoru; and Baba, Akio, 4,220,810, Cl. 174-68.500.

Baba, Kazushi; Miura, Hisashi; and Tominaga, Yoshiharu, to Mitsubishi Denki Kabushiki Kaisha; and Kawasaki Steel Corporation. Feed forward automatic thickness controlling method. 4,220,025, Cl. 72-8.000.

Baba, Toshiyuki; Ebihara, Isao; and Minegishi, Masatoshi, to Mitsubishi Paper Mills, Ltd. Glass-containing sheet substrate. 4,220,500, Cl. 162-127.000.

Babcock & Wilcox Company, The: *See*—
Pirsh, Edward A., 4,220,633, Cl. 423-239.000.

Backhouse, Alan J., to Imperial Chemical Industries Limited. Coating process. 4,220,679, Cl. 427-401.000.

Bader, Rolf; Kung, Leopold; and Waldvogel, Peter, to Ciba-Geigy Corporation. Process for the preparation of 2-aryl-2H-benzotriazoles. 4,220,788, Cl. 548-259.000.

Baer, Harold J.; and Morse, Glenn B., to Baer, Harold J.; Baer, Harold J., Jr.; and Baer, Lawrence J. Liquid-separating device. 4,220,533, Cl. 210-223.000.

Baer, Harold J., Jr.: *See*—
Baer, Harold J.; and Morse, Glenn B., 4,220,533, Cl. 210-223.000.

Baer, Lawrence J.: *See*—
Baer, Harold J.; and Morse, Glenn B., 4,220,533, Cl. 210-223.000.

Baird, Charles A.: *See*—
Pelchat, Guy M.; and Baird, Charles A., 4,220,923, Cl. 455-295.000.

Baker, Richard H.; and White, Kevin E., to Exxon Research & Engineering Co. Controller for waveform synthesizer. 4,220,988, Cl. 363-43.000.

Bakul, Valentin N.: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.

Balais, Marcelino P. Oral hygiene device. 4,220,144, Cl. 128-62.00A.

Ball Corporation: *See*—
McDowell, Jerry T., 4,220,030, Cl. 72-326.000.
Sanford, Gary G., 4,220,956, Cl. 343-706.000.

Ban, Hiroshi; Hori, Hideichi; Kudo, Ryoichi; and Yoshida, Akio, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Clutch assembly for use with an internal combustion engine. 4,220,233, Cl. 192-106.200.

Ban, Thomas E.; Sheppard, John C.; and Marlowe, William H., to McDowell-Wellman Company. Process for gasifying pelletized carbonaceous fuels. 4,220,454, Cl. 48-202.000.

Barbe, Pier C.: *See*—
Scata, Umberto; Luciani, Luciano; and Barbe, Pier C., 4,220,554, Cl. 252-429.00B.

Barber Manufacturing Company, The: *See*—
Streisel, John P., 4,220,132, Cl. 126-271.20R.

Barker, Charles E., to Robertshaw Controls Company. Pulsing probe for microwave oven. 4,220,840, Cl. 219-10.55B.

Barker, Peter J.; and Cheal, Gerald R., to Imperial Chemical Industries Limited. Method of thermoforming and product made therefrom. 4,220,683, Cl. 428-35.000.

Barlow, Roland J.; and Smith, Gary M., to Ex-Cell-O Corporation. Stop mechanism for worm gear set. 4,220,053, Cl. 74-425.000.

Barringer, Anthony R., to Barringer Research Limited. Laser spectrochemical analysis. 4,220,414, Cl. 356-318.000.

Barringer Research Limited: *See*—
Barringer, Anthony R., 4,220,414, Cl. 356-318.000.

Barten, Piet G. J.; Gerritsen, Jan; and Tendeloo, Kees, to U.S. Philips Corporation. Method of manufacturing a color display tube and color display tube manufactured according to said method. 4,220,897, Cl. 315-368.000.

Barton, Derek H. R.; Lester, David J.; and Ley, Steven V. Chemical processes. 4,220,588, Cl. 260-239.55A.

Bartzick, Gunter; and Buhne, Gerd, to Hoesch Werke Aktiengesellschaft. Arrangement for opening and cutting up packaging straps for scrap. 4,219,914, Cl. 29-56.500.

BASF Aktiengesellschaft: *See*—
Karg, Jochen; Patsch, Manfred; and Himmele, Walter, 4,220,777, Cl. 546-98.000.
Kincel, Roger S., 4,219,916, Cl. 29-149.50R.
Petersen, Harro; Fischer, Kurt; Klug, Hans; and Trimborn, Werner, 4,220,751, Cl. 528-232.000.
Scholz, Herbert, 4,220,787, Cl. 548-226.000.

BASF Wyandotte Corporation: *See*—
McBrayer, Robert L., 4,220,732, Cl. 521-167.000.

Bash, Leroy A.; Cherry, Raymond B.; Speck, Robert M.; and McDuffie, William N., to Cathodic Protection Services, Inc. Method and system for protecting barge. 4,220,951, Cl. 340-649.000.

Bauder, Armin: *See*—
Steinwart, Johannes; and Bauder, Armin, 4,220,129, Cl. 123-457.000.

Bauer, Gerhard: *See*—
Beckers, Karl D.; Hees, Eckart; and Bauer, Gerhard, 4,220,269, Cl. 222-600.000.

Bauer, Timothy R.: *See*—
Horton, Robert A.; Simmons, John H.; and Bauer, Timothy R., 4,220,190, Cl. 164-35.000.

Baugher, Robert C.: *See*—
Kiemer, Ralph F.; and Baugher, Robert C., 4,220,063, Cl. 83-635.000.

Baughman, Ray H.: *See*—
Preziosi, Anthony F.; Yee, Kwok C.; and Baughman, Ray H., 4,220,747, Cl. 526-285.000.

Baum, Matthew C.: *See*—
Pappas, Dennis G.; Baum, Matthew C.; Small, Samuel N.; Adams, Robert T.; and Freedman, Robert P., 4,220,907, Cl. 322-3.000.

Baum, Uwe. Shoe with an interchangeable heel. 4,219,946, Cl. 36-42.000.

Baumann, Hans-Peter, to Sandoz Ltd. Quaternated polyamine salts. 4,220,449, Cl. 8-606.000.

Baumann, Marcus: *See*—
Bohner, Beat; and Baumann, Marcus, 4,220,655, Cl. 424-274.000.

Bausch & Lomb Incorporated: *See*—
Martino, Ronald J., 4,220,982, Cl. 362-97.000.

Baxter Travenol Laboratories, Inc.: *See*—
Adams, Elvis E., 4,219,912, Cl. 128-214.00G.

Bayer Aktiengesellschaft: *See*—
Brack, Alfred, 4,220,780, Cl. 546-167.000.
Brauner, Dieter; Imhauser, Gunter; Kaluza, Hans; and Muschelknautz, Edgar, 4,220,416, Cl. 366-337.000.
Ehrig, Volker; Bien, Hans-Samuel, deceased; Klauke, Erich; and Schutze, Detlef-Ingo, 4,220,779, Cl. 546-152.000.
Findeisen, Kurt, 4,220,765, Cl. 544-179.000.
Halcourt, Kurt; Losacker, Paul; Martin, Manfred; Schenk, Norbert; and Schwerdtel, Wulf, 4,220,597, Cl. 260-369.000.
Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, 4,220,567, Cl. 260-22.00A.
Mietzsch, Fritz; Rudolph, Hans; Wolfers, Heinrich; and Alberts, Heinrich, 4,220,742, Cl. 526-209.000.
Reichmann, Wolfgang; Konig, Klaus; and Nordmann, Heinz-Georg, 4,220,749, Cl. 528-44.000.
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,220,663, Cl. 424-330.000.
Stoltefuss, Jurgen, 4,220,782, Cl. 546-242.000.

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. 4,220,468, Cl. 71-124.000.

Bays, Caroline. Device for positioning a pattern strip chart. 4,219,950, Cl. 40-518.000.

Bazile, Yves; de Cointet de Fillain, Paul; and Pigerol, Charles, to Labaz. Process for preparing a thiophene derivative. 4,220,793, Cl. 549-68.000.

Beale, John H.: *See*—
Coplan, Myron J.; Beale, John H.; and Davis, Robert B., 4,220,489, Cl. 156-73.600.

Beall, Glenn L.; and Noonan, Robert P., to Miles Laboratories, Inc. Biological specimen process apparatus. 4,220,252, Cl. 220-307.000.

Bear, Russell M. Electro-mechanical chemical firearm device. 4,220,443, Cl. 431-91.000.

Bearden, John L.; Gopalakrishnan, Sankaraiyer; and Tuzson, John J., to Borg-Warner Corporation. Pump modification for matching performance. 4,219,917, Cl. 29-156.40R.

Beatty, William E., Jr.: *See*—
Wafer, John A.; and Beatty, William E., Jr., 4,220,935, Cl. 335-38.000.

Becker, Klaus; and Behrmann, Dieter. Adjustable support apparatus for segments of an amusement slide. 4,220,326, Cl. 272-56.50R.

Beckers, Karl D.; Hees, Eckart; and Bauer, Gerhard, to Martin & Pagenstecher GmbH; and Thyssen Aktiengesellschaft, vorm. August Thyssen-Hutte. Slide gate nozzle for a casting vessel. 4,220,269, Cl. 222-600.000.

Bedford, Clifford D.: *See*—
Nielsen, Arnold T.; and Bedford, Clifford D., 4,220,804, Cl. 568-584.000.

Beede, Jefts G. Combination lock. 4,220,023, Cl. 70-312.000.

Beekmans, Antonius A. G., to U.S. Philips Corporation. Magnetic shielding for an X-ray image intensifier tube. 4,220,890, Cl. 313-240.000.

Behel, O'Neal. Cot structure. 4,219,896, Cl. 5-114.000.

Behr, Hans. Apparatus for painting parts of large surface area. 4,220,282, Cl. 239-187.000.

Behrmann, Dieter: *See*—
Becker, Klaus; and Behrmann, Dieter, 4,220,326, Cl. 272-56.50R.

Beichel, Rudi, to Aerojet-General Corporation. Dual expander rocket engine. 4,220,001, Cl. 60-225.000.

Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., to Burgess Vibrocrafters, Inc. Oscillating water sprinkler. 4,220,284, Cl. 239-242.000.

Bell, Malcolm R.; and Oesterlin, Rudolf, to Sterling Drug Inc. Cyclopenta[o]pyrrole derivatives. 4,220,763, Cl. 544-143.000.

Bell Telephone Laboratories, Incorporated: *See*—
Alles, Harold G., 4,220,990, Cl. 364-200.000.
Atal, Bishnu S., 4,220,819, Cl. 179-1.0SA.
Bloom, David M.; and Liao, Paul F., 4,220,928, Cl. 330-4.300.
Burke, Edmund T.; and Jones, David F., 4,220,827, Cl. 179-99.0LS.
Rao, Tadikonda N.; and Wilson, Thomas G., Jr., 4,220,987, Cl. 363-21.000.
Skurkiss, Peter K.; and Turner, Dennis R., 4,220,506, Cl. 204-28.000.

Belletire, John L., to Pfizer Inc. Organic diamine therapeutic compositions and methods. 4,220,650, Cl. 424-267.000.

Beloit Corporation: *See*—
Skaugen, Borgeir, 4,220,501, Cl. 162-200.000.

Benasutti, John E., to GTE Products Corporation. Optical fiber connector. 4,220,397, Cl. 350-96.210.

Benasutti, Louis D.: *See*—
Braden, Ralph S.; Benasutti, Louis D.; and Neubauer, Jerry L., 4,220,266, Cl. 222-477.000.

Bendix Corporation, The: *See*—
Kluger, Michael A., 4,220,227, Cl. 188-196.0BA.
Luca, Vincent A., Jr.; Knapp, Carl L.; and Schildkraut, Alan L., 4,220,385, Cl. 339-59.00M.

Bene, Robert; Fortini, Joseph A.; and Giacomini, Maximiliano, to Country Log Homes, Inc. Log building construction. 4,219,977, Cl. 52-94.000.

Benedek, Herman: *See*—
Fischbein, Miklos; and Benedek, Herman, 4,219,919, Cl. 29-270.000.

Bengtsson, Bengt L.; Bosund, Sven I. W.; and Hylmo, Bertil, to Produits Findus S.A. Preparation of deep-frozen leaf vegetables in granular form. 4,220,672, Cl. 426-615.000.

Benoit, Lloyd F. Directional drilling sub. 4,220,214, Cl. 175-61.000.

Berg, Alexander; Eckmayer, Zdenek; Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Method for treating raw materials containing collagen. 4,220,724, Cl. 435-273.000.

Berg, Alexander: *See*—
Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,723, Cl. 435-265.000.

Berges, David A., to SmithKline Corporation. 7-Acylamino-3-(substituted tetrazolyl thiomethyl) cephalosporins. 4,220,644, Cl. 424-246.000.

Bergman, Mark O.; Leary, John W.; Sanborn, Duane F.; and Ware, Chester D., to Trane Company, The. Air cooled centrifugal refrigeration system with water heat recovery. 4,220,011, Cl. 62-185.000.

Berich, John J. Lock mechanism. 4,220,024, Cl. 70-416.000.

Beringer Co., Inc.: *See*—
Dwan, Thomas S., 4,220,480, Cl. 134-5.000.

Berlin, Howard M.; and Johnson, Arthur T. Perturbation device for the measurement of airway resistance. 4,220,161, Cl. 128-720.000.

Bernath, Gabor: *See*—
Hermecz, Istvan; Fulop, Ferenc; Meszaros, Zoltan; Bernath, Gabor; and Knoll, Jozsef, 4,220,771, Cl. 544-252.000.

Berthold, Rudiger; Mees, Bernhard; and Heise, Hartmut, to Hoechst Aktiengesellschaft. Process for the preparation of condensation products of acetoacetic esters and aldehydes. 4,220,799, Cl. 560-126.000.

Bertsch, Richard: *See*—
Utz, Eberhard; Fehrenbach, Siegfried; Klett, Dittmar; Bertsch, Richard; and Knapp, Heinrich, 4,220,123, Cl. 123-327.000.

Beuchet, Gerard: *See*—
Duchemin, Jean-Pascal; Leguen, Daniel; Bonnet, Michel; Koelsch, Francois; and Beuchet, Gerard, 4,220,488, Cl. 148-175.000.

Bice, Charles D., to Westinghouse Electric Corp. Bi-switch construction having an auxiliary interrupting device associated therewith. 4,220,837, Cl. 200-146.00R.

Biche, Barton A.; and Stupay, Lawrence J., to Bunker Ramo Corporation. Medical clip. 4,220,387, Cl. 339-61.00R.

Bien, Else, Gabriele Bien, Dorothee Bien, legal representatives: *See*—
Ehrig, Volker; Bien, Hans-Samuel, deceased; Klauke, Erich; and Schutze, Detlef-Ingo, 4,220,779, Cl. 546-152.000.

Bien, Hans-Samuel, deceased: *See*—
Ehrig, Volker; Bien, Hans-Samuel, deceased; Klauke, Erich; and Schutze, Detlef-Ingo, 4,220,779, Cl. 546-152.000.

Bienek, Artur. Plate bearing. 4,220,378, Cl. 308-25.000.

Bio Research Center Co., Ltd.: *See*—
Taoka, Akira; and Uchida, Seiichi, 4,220,720, Cl. 435-142.000.

Biomedical International Company: *See*—
Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 4,220,159, Cl. 128-639.000.

Birle, John D.: *See*—
St. Pierre, Philippe D.; Morelock, Charles R.; and Birle, John D., 4,220,455, Cl. 51-295.000.

Bjodstrup, Ole J. Tool for deburring tubes of different width. 4,220,060, Cl. 82-4.00C.

Black, John W., to Pemco-Kalamazoo, Inc. Bearing retainer. 4,219,903, Cl. 16-21.000.

Blackmer, David E.: *See*—
Talbot, Daniel B.; and Blackmer, David E., 4,220,929, Cl. 330-136.000.

Blanz, Karl, to Trumpf Maschinen AG. Machine having a plurality of reciprocating working tools which may be selectively brought into operation. 4,220,062, Cl. 83-71.000.

Bleiman, Arnold M.; and Russell, Gordon A., to Suntech, Inc. Label stripping apparatus and method. 4,220,481, Cl. 134-6.000.

Blidung, Otto; and Tolasch, Gerhard, to Hauni-Werke Korber & Co. KG. Apparatus for conveying and temporary storage of cigarette packs or the like. 4,220,236, Cl. 198-347.000.

Bloch, Joseph T.: *See*—
United States of America, National Aeronautics and Space Administration; Bloch, Joseph T.; Hanger, Randolph T.; and Nichols, Frank W., 4,219,926, Cl. 29-832.000.

Bloch, Winston N., Jr. Neck x-ray protective shield. 4,220,867, Cl. 250-516.000.

Block, William V., to Fremont Industries, Inc. Paint removal composition spray method for paint booths. 4,220,456, Cl. 55-85.000.

Blood, Thomas S.; and Hooker, Stephan F. Portable event analysis device. 4,220,992, Cl. 364-410.000.

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Emert, George H.; and Blotkamp, Paul J., 4,220,721, Cl. 435-165.000.

Blount, David H. Process for the production of alkali metal-cellulose-silicates and their reaction products. 4,220,757, Cl. 536-84.000.

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Bochumer Eisenhutte Heintzmann GmbH & Co.: *See*—
Nerlich, Ernst-Gunter, 4,220,424, Cl. 405-302.000.

Bock, Jan; Thame, Neville G.; and Westerman, Lowell, to Exxon Research & Engineering Co. Novel ionic polymer compositions. 4,220,573, Cl. 260-23.50A.

Boczewski, Michael P., to Maple Leaf Mills Limited. Process for the treatment of oats. 4,220,287, Cl. 241-9.000.

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Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 4,220,659, Cl. 424-309.000.

Boehringer Mannheim GmbH: *See*—
Rittersdorf, Walter; Tiedemann, Hugo; Werner, Wolfgang; and Wielinger, Hans, 4,220,713, Cl. 435-14.000.

Boeing Company, The: *See*—
Hametner, Albert L.; Merrell, Hollis B.; and Trethewy, Brian R., 4,220,275, Cl. 227-5.000.

Bogert, Robert C.: *See*—
Rudy, Marion F., 4,219,945, Cl. 36-29.000.

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Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, 4,220,567, Cl. 260-22.00A.

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Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, to Swiss Aluminium Ltd. Process for melting material. 4,220,843, Cl. 219-121.00P.

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Bearden, John L.; Gopalakrishnan, Sankaraiyer; and Tuzson, John J., 4,219,917, Cl. 29-156.40R.
Harnish, James R., 4,220,013, Cl. 62-209.000.
Petzold, Werner P., 4,220,058, Cl. 74-751.000.

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Boschi, Pier Marino: *See*—
Gozzo, Franco; Boschi, Pier Marino; and Longoni, Angelo, 4,220,789, Cl. 548-263.000.

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Bengtsson, Bengt L.; Bosund, Sven I. W.; and Hylmo, Bertil, 4,220,672, Cl. 426-615.000.

Bottum, Edward W. Refrigerant charged solar heating structure and system. 4,220,138, Cl. 126-433.000.

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Kern, Horstmar; and Botzenhardt, Helmut, 4,219,983, Cl. 52-730.000.

BP Chemicals Limited: *See*—
Huitson, John J., 4,220,661, Cl. 424-317.000.

Brack, Alfred, to Bayer Aktiengesellschaft. Cationic dyestuffs. 4,220,780, Cl. 546-167.000.

Braden, Ralph S.; Benasutti, Louis D.; and Neubauer, Jerry L., to White Consolidated Industries, Inc. Ice door delay mechanism. 4,220,266, Cl. 222-477.000.

Bradley, Edward W.: *See*—
Fisher, Gerald L.; and Bradley, Edward W., 4,220,856, Cl. 250-337.000.

Braginetz, Paul A.; Powers, Grady M.; and Stowers, Kimball E., to Virginia Panel Corporation. Fixture for use in aligning multiple contacts of receiver units in computer interface equipment. 4,219,935, Cl. 33-174.00R.

Brandenberg, Karl A., to Aro Corporation, The. Connector for plastic tubing. 4,220,361, Cl. 285-323.000.

Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., to Givaudan Corporation. Iodopropargyl pyridyl and picolinyl ethers and thioethers as paint fungicides. 4,220,577, Cl. 260-29.6MN.

Branham, Richard A.: *See*—
Wert, Harry E.; and Branham, Richard A., 4,220,833, Cl. 179-175.31R.

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Hennessey, William M.; and Bratro, Frederick E., 4,220,809, Cl. 174-52.00R.

Brauner, Dieter; Imhauser, Gunter; Kaluza, Hans; and Muschelknautz, Edgar, to Bayer Aktiengesellschaft. Apparatus for the continuous static mixing of flowable substances. 4,220,416, Cl. 366-337.000.

Bray, Geddes A., to Mather & Platt Limited. Detection of gases. 4,220,452, Cl. 23-232.00R.

Bray, Thomas B. Tassel puller. 4,219,991, Cl. 56-63.000.

Breidenbend, Anton: *See*—
Koser, Rolf; Haberstock, Egon; Breidenbend, Anton; and Wonderschutz, Manfred, 4,220,028, Cl. 72-117.000.

Bremer, Robert C., Jr., to Wallace Murray Corporation. Torsional vibration damper. 4,220,056, Cl. 74-574.000.

Bretthauer, Klaus: *See*—
Prohaska, Helmut; Reiterer, Franz; Bretthauer, Klaus; and Kloss, Helmut, 4,220,484, Cl. 148-6.300.

Bridges, Thomas N., to United States of America, Air Force. Hole angularity gage. 4,219,936, Cl. 33-174.00Q.

Bridgestone Tire Company Limited: *See*—
Kawaida, Sinji; and Kitayama, Yoshihumi, 4,220,494, Cl. 156-415.000.
Koga, Tomohiro; Saigusa, Tetsuji; and Kadono, Mamoru, 4,220,180, Cl. 138-120.000.

Bright, Clark I., to Systron-Donner Corporation. Optical flame and explosion detection system and method. 4,220,857, Cl. 250-339.000.

Brister, Beryle D. Apparatus for freezing a slug of liquid in a section of a large diameter fluid transmission line. 4,220,012, Cl. 62-130.000.

Britt, Pope P., to General Electric Company. Dual frequency horn antenna system. 4,220,957, Cl. 343-756.000.

Brock, Norbert, to Asta-werke Aktiengesellschaft, Chemische Farik. Process for the treatment of humans suffering from undesired urotoxic side effects caused by cytostatically active alkylating agents. 4,220,660, Cl. 424-315.000.

Bromberg, Howard M., to Flexi-Group, Inc., The. Method of making a slide calculator. 4,220,075, Cl. 93-1.00F.

Brook, Richard L., to DeSoto, Inc. Encapsulated impregnated rovings. 4,220,686, Cl. 428-375.000.

Brossman, William C.; McElhaney, Joseph G.; and Rooney, James H., III, to Armstrong Cork Company. Lumber marking apparatus. 4,220,115, Cl. 118-684.000.

Brouthers, Paul E., to D. W. A. Associates. Firearm. 4,219,954, Cl. 42-67.000.

Brown, Billy R. Pre-cast reinforced concrete building panel wall structure. 4,219,978, Cl. 52-125.000.

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Jahnke, Frederick C.; MacLean, John P.; Williams, Dale; and Brown, John D., 4,220,623, Cl. 422-144.000.

Brown, Thomas H.; and Ife, Robert J., to Smith Kline & French Laboratories Limited. Triazinones. 4,220,767, Cl. 544-182.000.

Brownbill, Thomas D., to Metal Closures Group Limited. Closure for containers. 4,220,250, Cl. 215-270.000.

Brucher, Eberhard, to Dango & Dienenthal Maschinebau GmbH. Swiveling mechanism particularly for taphole plugging devices. 4,220,321, Cl. 266-271.000.

Brueck, Steven R. J.; and Osgood, Richard M., Jr., to Massachusetts Institute of Technology. Method for separating isotopes in the liquid phase at cryogenic temperature. 4,220,510, Cl. 204-157.10R.

Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, to Henkel Kommanditgesellschaft auf Ak-

tien (Henkel KGaA). 2-Cyclopropyl-4-isopropyl-2,5,5-trimethyl-1,3-dioxane as odorant. 4,220,593, Cl. 260-340.700.
Brunswick Corporation: *See*—
Maggiorana, Mario A., 4,220,121, Cl. 123-41.800.
Brynko, Carl; and Brynko, Carl G., to Reprographic Materials, Inc. Direct imaging pressure fixable magnetic toners. 4,220,698, Cl. 430-109.000.
Brynko, Carl G.: *See*—
Brynko, Carl; and Brynko, Carl G., 4,220,698, Cl. 430-109.000.
Buckner, Ian W., to Plessey Handel und Investments AG. Noise detector employing plural delay circuits. 4,220,926, Cl. 328-165.000.
Buhne, Gerd: *See*—
Bartzick, Gunter; and Buhne, Gerd, 4,219,914, Cl. 29-56.500.
Bundaberg Foundry Company Limited, The: *See*—
Gatley, Thomas W., 4,220,288, Cl. 241-37.000.
Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-5,6-didehydro-PGF_1 compounds. 4,220,796, Cl. 560-121.000.
Bundy, Gordon L., to Upjohn Company, The. Novel 9-deoxy-16,16-dimethyl-PGF_2 compounds, intermediates and process. 4,220,797, Cl. 560-121.000.
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Biche, Barton A.; and Stupay, Lawrence J., 4,220,387, Cl. 339-61.00R.
Krolak, Ronald F.; and Radloff, Frederick J., 4,220,391, Cl. 339-126.00R.
Burack, Robert D.; and Shaffer, Robert, to Westinghouse Electric Corp. Machine and method for decontaminating nuclear steam generator channel head. 4,219,976, Cl. 51-411.000.
Burch, Darrel W.; and Wojciehowski, James P., to Garrett Corporation, The. Pneumatic starter overtemperature control. 4,220,439, Cl. 415-9.000.
Burgdorf, Jochen; and Luepertz, Hans-Henning, to ITT Industries, Inc. Braking pressure control unit. 4,220,375, Cl. 303-6.00C.
Burger, Alfred; and Paar, Adalbert, to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Gesellschaft m.b.H. Kommanditgesellschaft. Control device for use in a lock. 4,220,021, Cl. 70-276.000.
Burgess Vibrocrafters, Inc.: *See*—
Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., 4,220,284, Cl. 239-242.000.
Burgoon, Jack L.; and Knowlton, Christopher M., to Scott & Fetzer Company, The. Riding sweeper. 4,219,901, Cl. 15-352.000.
Burke, Edmund T.; and Jones, David F., to Bell Telephone Laboratories, Incorporated. Telephone signaling circuit. 4,220,827, Cl. 179-99.0LS.
Burroughs Corporation: *See*—
Hennessey, William M.; and Bratro, Frederick E., 4,220,809, Cl. 174-52.00R.
Hochberg, Arthur K., 4,220,116, Cl. 118-715.000.
Morreale, Charles, 4,220,845, Cl. 219-243.000.
Rhyins, Richard W.; and Hurkmans, Antoon M., 4,220,978, Cl. 358-293.000.
Burrows, Walter H.: *See*—
Moore, Ronnie J.; and Burrows, Walter H., 4,220,549, Cl. 252-171.000.
Burt, Wayne E. Minesweeping method and apparatus. 4,220,108, Cl. 114-244.000.
Burton Silverplating Company: *See*—
Hanley, William H.; and Schrader, Clarence O., 4,220,504, Cl. 204-15.000.
Butler, David V.: *See*—
Orlowski, Jan A.; Kidd, Patrick D.; and Butler, David V., 4,220,582, Cl. 260-42.280.
Byrne, Michael, to General Electric Company. Ionization chamber for a smoke detector having an improved arrangement for capturing airborne combustion products. 4,220,862, Cl. 250-384.000.
C. J. Wennberg AB: *See*—
Norberg, Gustav S. I.; and Segerstrom, Kjell E. L., 4,220,240, Cl. 198-408.000.
C. L. Frost & Son, Inc.: *See*—
Frost, Charles C.; and Weis, Siegfried K., 4,220,243, Cl. 198-687.000.
Cabrera, Pedro P.: *See*—
Simpson, Ronald O.; and Cabrera, Pedro P., 4,220,621, Cl. 422-103.000.
Caceres, Cesar A.: *See*—
Kimball, John P.; and Caceres, Cesar A., 4,220,160, Cl. 128-715.000.
Calgon Corporation: *See*—
Howell, George D.; and Lange, Donald A., 4,220,485, Cl. 148-6.15Z.
Carl Still, Firma: *See*—
Tippmer, Kurt, 4,220,469, Cl. 75-91.000.
Carl Zeiss Stiftung: *See*—
Muchel, Franz, 4,220,401, Cl. 351-13.000.
Carley, Earl P.; and Ackley, Richard H., to PPG Industries, Inc. High strength composite of resin, helically wound fibers and chopped fibers and method of its formation. 4,220,496, Cl. 156-174.000.
Carley, Earl P., to PPG Industries, Inc. High strength composite of resin, helically wound fibers and swirled continuous fibers and method of its formation. 4,220,497, Cl. 156-174.000.
Carlo, Dennis J.: *See*—
Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,220,638, Cl. 424-92.000.
Limjuco, Guadalupe A.; Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,220,584, Cl. 260-112.00R.
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Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,220,759, Cl. 542-426.000.
Carlson, Roland W.; and Jagatich, Carl T., to Ohio Nuclear, Inc. Tomographic scanner with cadmium tungstate scintillation crystals. 4,220,860, Cl. 250-361.00R.
Carlson, Russell L., to Morgan Adhesives Company. Method of making a laminate with removable scored paper backing. 4,220,490, Cl. 156-257.000.
Carlsson, Bo; and Johansson, Stig, to Centro-Maskin Goteborg AB. Grinding machine for chamfering workpiece end surfaces. 4,219,973, Cl. 51-90.000.
Carnahan, James C., to General Electric Company. Linear dimers of bisphenols and method for making. 4,220,805, Cl. 568-592.000.
Carre, Roland, to Thomson-CSF. Circuit arrangement for improving accuracy of angular measurements in radar systems. 4,220,953, Cl. 343-16.00M.
Carter, James L.; and Sinfelt, John H., to Exxon Research & Engineering Co. Startup method for a reforming process. 4,220,520, Cl. 208-139.000.
Carter, William W. Plow with improved tool raising construction. 4,220,209, Cl. 172-259.000.
Caruso, Albert P. Combined holder for keys and protective spray. 4,220,263, Cl. 222-183.000.
Cassella Aktiengesellschaft: *See*—
Tappe, Horst, 4,220,784, Cl. 546-296.000.
Castriotta, Michele; and De Micheli, Spiridione, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Interface linking synchronous sense and drive matrices of telephone system with a processor of signalization data. 4,220,824, Cl. 179-18.00J.
Cataldo, Roy S.; and Salamon, Theodore M., to General Motors Corporation. Passive seat belt system. 4,220,354, Cl. 280-803.000.
Catalytic Generators, Inc.: *See*—
Freebairn, Hugh T.; and McDonnell, Jerry F., 4,219,965, Cl. 47-2.000.
Caterpillar Tractor Co.: *See*—
Ringness, Robert F., 4,220,216, Cl. 180-9.500.
Stark, Sheldon L., 4,220,215, Cl. 180-6.700.
Cathodic Protection Services, Inc.: *See*—
Bash, Leroy A.; Cherry, Raymond B.; Speck, Robert M.; and McDuffie, William N., 4,220,951, Cl. 340-649.000.
Catlett, John C., to Stanley Works, The. Electromechanical door operator. 4,220,051, Cl. 74-89.150.
Cavalier Corporation: *See*—
Lindsey, James C.; and Morgan, Gregory S., 4,220,235, Cl. 194-10.000.
Cazcarra, Victor G., to International Business Machines Corporation. Method of increasing the gettering effect in the bulk of semiconductor bodies utilizing a preliminary thermal annealing step. 4,220,483, Cl. 148-1.500.
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Carlsson, Bo; and Johansson, Stig, 4,219,973, Cl. 51-90.000.
Cerefice, Steven A.; and Paschke, Edward E., to Standard Oil Company (Indiana). Alkyl alkoxymethylbenzoates. 4,220,753, Cl. 528-302.000.
Cessna Aircraft Company, The: *See*—
Jackson, Alan D., 4,220,178, Cl. 137-625.300.
Chadwick, Dennis P.: *See*—
Trott, Clarence R.; Veldhoven, Gerardus A.; and Chadwick, Dennis P., 4,220,280, Cl. 239-1.000.
Champion Brass Mfg. Co.: *See*—
Citron, Manning, 4,220,283, Cl. 239-205.000.
Chang, Clarence D.; and Lang, William H., to Mobil Oil Corporation. Synthesis of pyridine and alkylpyridines. 4,220,783, Cl. 546-251.000.
Chang, Hsu; and Nigam, Anil, to International Business Machines Corporation. Bubble domain relational data base system. 4,221,003, Cl. 364-900.000.
Chang, Soo-Duck. Filter for brewing coffee or the like. 4,220,541, Cl. 210-474.000.
Chaphalkar, Dhananjay V.: *See*—
Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., 4,220,284, Cl. 239-242.000.
Chaplin, Gervase M.: *See*—
Wyndham, Ronald; Chaplin, Gervase M.; and Lippman, Alfred, 4,220,629, Cl. 423-76.000.
Chauvet, Francis. Synchronizing means for motor-drive systems. 4,220,403, Cl. 352-17.000.
Cheal, Gerald R.: *See*—
Barker, Peter J.; and Cheal, Gerald R., 4,220,683, Cl. 428-35.000.
Chedid, Louis: *See*—
Audibert, Francoise; Chedid, Louis; Choay, Jean; Lederer, Edgar; and Lefrancier, Pierre, 4,220,637, Cl. 424-88.000.
Cheng, Jiin-Duey, to Du Pont de Nemours, E. I., and Company. Imidazothiazine-1,3(2H)-diones. 4,220,465, Cl. 71-90.000.
Cherry, Raymond B.: *See*—
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Cherry, Wesley R.: *See*—
Dickason, Alan F.; and Cherry, Wesley R., 4,220,595, Cl. 260-346.750.
Chewning, Charles H., Jr.: *See*—
Winch, Allen R.; and Chewning, Charles H., Jr., 4,219,908, Cl. 19-99.000.
Chiang, Shang-Yi: *See*—
Liu, Yet-Zen; and Chiang, Shang-Yi, 4,220,960, Cl. 357-17.000.

Chiba, Yasutsune; Arima, Shizuo; Suzuki, Shoji; and Saitoh, Masayuki, to Taisan Industrial Co., Ltd. Raising-pressure delay type electromagnetic pumps. 4,220,910, Cl. 323-19.000.

Chibret, Henri, to Thea (Therapeutique et Applications) SA. Chromone derivatives. 4,220,645, Cl. 424-248.580.

Childress, Evelyn O.: *See—*
Pope, George F.; and Childress, Evelyn O., 4,220,949, Cl. 340-533.000.

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Hermecz, Istvan; Fulop, Ferenc; Meszaros, Zoltan; Bernath, Gabor; and Knoll, Jozsef, 4,220,771, Cl. 544-252.000.

Chirico, Vincent E.: *See—*
Vegvari, Paul C.; Hess, William M.; and Chirico, Vincent E., 4,220,042, Cl. 73-150.00R.

Choay, Jean: *See—*
Audibert, Francoise; Chedid, Louis; Choay, Jean; Lederer, Edgar; and Lefrancier, Pierre, 4,220,637, Cl. 424-88.000.

Cholet, Jacques, to Institut Francais du Petrole. Device for controlling the depth of an element towed in water. 4,220,109, Cl. 114-245.000.

Christopher, Glenn B., to Jet Research Center, Inc. Powdered metal casing for perforating charge and its method of manufacture. 4,220,687, Cl. 428-546.000.

Chrysler Corporation: *See—*
Gale, Thomas C.; Graves, Richard A.; and Lobanoff, Mark, 4,220,367, Cl. 296-37.160.

Chuard, Edmond H. Display device for ornamental objects. 4,220,018, Cl. 63-29.00R.

Ciba-Geigy Corporation: *See—*
Bader, Rolf; Kung, Leopold; and Waldvogel, Peter, 4,220,788, Cl. 548-259.000.
Bohner, Beat; and Baumann, Marcus, 4,220,655, Cl. 424-274.000.
Cseh, Georg; Roueche, Armand; and Hari, Stefan, 4,220,586, Cl. 260-157.000.
Gass, Karl, 4,220,770, Cl. 544-208.000.
Green, George E.; and Zahir, Abdul-Cader, 4,220,513, Cl. 204-159.230.
Martin, Henry, 4,220,464, Cl. 71-77.000.
Renner, Alfred; and Zahir, Sheik A., 4,220,741, Cl. 525-422.000.
Rosenberger, Siegfried, 4,220,571, Cl. 260-45.9NC.
Zuppinger, Paul, 4,220,731, Cl. 521-156.000.

Cimperman, Frederick J.: *See—*
Margaroli, John L.; and Cimperman, Frederick J., 4,220,080, Cl. 99-494.000.

Ciscon, Julian J. Adjustable pivoting hand rake. 4,219,994, Cl. 56-400.140.

Ciszewski, Tadeusz; and Gudra, Tadeusz, to Politechnika Wroclawska. Electroacoustic sandwich transducer with bonded joints. 4,220,886, Cl. 310-325.000.

Citizen Watch Company, Limited: *See—*
Ichikawa, Singo; and Kato, Yoshiaki, 4,219,999, Cl. 368-66.000.

Citron, Manning, to Champion Brass Mfg. Co. Vegetation sprinkler having a hand adjustment to direct the spray. 4,220,283, Cl. 239-205.000.

CL Industries Inc.: *See—*
Kho, Khe-Bing J.; and Stewart, Patrick H., 4,220,578, Cl. 260-31.80M.

Clark, Harold E.; and Clarl, Paul T. Counterweighted brassiere for athletic use. 4,220,157, Cl. 128-510.000.

Clark, Justin S.; and Farr, Frederick L., to Intermountain Health Care. Alveolar gas sampling system and method. 4,220,162, Cl. 128-724.000.

Clark, Peter E.: *See—*
Constien, Vernon G.; and Clark, Peter E., 4,220,566, Cl. 260-13.000.

Clark, Richard P.; and Zimmerman, Gary L., to AMP Incorporated. Loose piece terminal mounting assembly. 4,220,384, Cl. 339-59.00M.

Clark, Ricky L.: *See—*
Powers, Thomas R.; and Clark, Ricky L., 4,220,429, Cl. 408-224.000.

Clark, Scott A.; and Ulmer, William E., to S. A. Clark & Associates. Air flow sensor. 4,220,950, Cl. 340-594.000.

Clarkson Industries, Inc.: *See—*
Lee, Wilfred J., 4,220,539, Cl. 210-401.000.

Clarl, Paul T.: *See—*
Clark, Harold E.; and Clarl, Paul T., 4,220,157, Cl. 128-510.000.

Clement, Jean-Claude: *See—*
Anquetil, Jean-Pierre; Deflin, Michel; Clement, Jean-Claude; and Neel, Emmanuel E. A., 4,220,560, Cl. 252-468.000.

Clifford, Michael L., to Imperial Chemical Industries Limited. Quench bath. 4,220,620, Cl. 264-560.000.

Clinical Systems Associates, Inc.: *See—*
Kimball, John P.; and Caceres, Cesar A., 4,220,160, Cl. 128-715.000.

Close, Albert R.: *See—*
Henderson, Cyril; Hollowell, William; and Close, Albert R., 4,220,355, Cl. 280-804.000.

Cloutier, Jean-Marie. Biplanar joint distractor. 4,220,146, Cl. 128-69.000.

Coal Industry (Patents) Limited: *See—*
Armstrong, Michael P.; and O'Brian, Rodney W., 4,220,526, Cl. 209-240.000.

Cobaugh, Robert F.; and Graeff, Norwood C., to AMP Incorporated. Terminating means for terminating more than one wire in a single slotted terminal. 4,220,390, Cl. 339-97.00R.

Codelco-Chile: *See—*
Poblete, Raul, 4,220,524, Cl. 209-166.000.

Coeuillet, Jacques: *See—*
Abeille, Jean; Coeuillet, Jacques; Coutenceau, Francois; and Grandfils, Claude, 4,220,004, Cl. 60-413.000.

Coffey, Michael D.: *See—*
Frenier, Wayne W.; Coffey, Michael D.; Huffines, James D.; and Smith, Donald C., 4,220,550, Cl. 252-180.000.

Cohen, Arthur N.: *See—*
Cueto, Ronald E.; and Cohen, Arthur N., 4,220,306, Cl. 248-328.000.

Cohen, Hyman L.: *See—*
McGuckin, Hugh G.; and Cohen, Hyman L., 4,220,700, Cl. 430-143.000.

Colbert, William V.: *See—*
Degner, Vernon R.; and Colbert, William V., 4,220,612, Cl. 261-76.000.

Cole, John W.: *See—*
Hixson, Harry F., Jr.; Green, Billy J.; Cummins, Laurence M.; and Cole, John W., 4,220,598, Cl. 260-397.100.

Cole Manufacturing Company: *See—*
Hatcher, John C., 4,220,350, Cl. 280-656.000.

Coleman, Clyde F., to RCA Corporation. Video disc player having modular construction. 4,220,338, Cl. 274-2.000.

Coleman, Clyde F.; and Farley, Nicki L., to RCA Corporation. Caddy-actuated declutching mechanism for video disc player. 4,220,339, Cl. 274-9.00B.

Coliva, Luigi, to Essico S.r.l. Continuous drying chamber. 4,219,942, Cl. 34-203.000.

Colombo, Sergio; and Terra, Luigi, to SELO Societa Electtronica Lombarda S.p.A. Gamma camera tomography apparatus. 4,220,861, Cl. 250-363.00S.

Colorado State University Research Foundation: *See—*
Kimberling, Cleon V.; and Rupp, Gary P., 4,220,155, Cl. 128-306.000.

Colton, Roland J. Jet engine with noise energy dissipation. 4,220,002, Cl. 60-271.000.

Columbian Chemicals Company: *See—*
Vegvari, Paul C.; Hess, William M.; and Chirico, Vincent E., 4,220,042, Cl. 73-150.00R.

Combs, Charles M.; and Goodwin, Perry H., Jr., to Robertshaw Controls Company. Adjustable ultrasonic level measurement device. 4,221,004, Cl. 367-114.000.

Combustion Engineering, Inc.: *See—*
Deem, Calvin K., 4,220,505, Cl. 204-94.000.
Prichard, Guy, Jr., 4,220,239, Cl. 198-403.000.
Romanos, Nicholas D., 4,220,199, Cl. 165-134.00R.

Commissariat a l'Energie Atomique: *See—*
Marhic, Gerard; and Martin, Philippe, 4,220,889, Cl. 313-38.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Holan, George; and Walser, Reimund A., 4,220,591, Cl. 260-340.50R.

Communications Satellite Corporation: *See—*
Lucas, Jerome G., 4,220,821, Cl. 370-110.000.

Concast, Inc.: *See—*
Johnson, Lyle J.; Mote, Jimmy D.; and Yoblin, Jack A., 4,220,027, Cl. 72-56.000.

Concept Engineering Inc.: *See—*
Geschwender, Robert C., 4,220,346, Cl. 280-47.180.

Conley, J. Howard: *See—*
Hammond, Ronald W.; and Conley, J. Howard, 4,220,459, Cl. 55-341.00R.

Connors, William P. Apparatus for prolonged storage of garbage. 4,220,014, Cl. 62-239.000.

Conrad, Jens: *See—*
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,220,593, Cl. 260-340.700.

Constien, Vernon G.; and Clark, Peter E., to Dow Chemical Company, The. Aqueous based slurry containing enediol breaker and method for forming a consolidated gravel pack. 4,220,566, Cl. 260-13.000.

Contraves AG: *See—*
Reichlin, Anton; Richter, Harald; and Paluschinski, Hans, 4,220,999, Cl. 364-900.000.

Cook, Donald F.: *See—*
Kyle, James C.; and Cook, Donald F., 4,220,814, Cl. 174-152.0GM.

Cook, Elton S.; and Fujii, Akira. Guanidinocyclohexanecarboxylic acids. 4,220,662, Cl. 424-319.000.

Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., to NL Industries, Inc. Castor based quaternaries. 4,220,581, Cl. 260-402.500.

Copal Company Limited: *See—*
Inoue, Nobuyoshi, 4,220,409, Cl. 354-247.000.

Coplan, Myron J.; Beale, John H.; and Davis, Robert B., to Albany International Corporation. Method of fabricating a hollow filament separator module. 4,220,489, Cl. 156-73.600.

Corcoran, Patrick G. Wine rack. 4,220,245, Cl. 211-49.00R.

Corsi, Pietro E., to S.p.A. Cellograf-Simp. Multilayered structure incorporating a thermometer. 4,220,680, Cl. 428-1.000.

Cosmos, Pete, to True Temper Corporation. Lawn rakes. 4,219,993, Cl. 56-400.170.

Cosnard, Jean-Claude; Sarafinof, Pierre; and Vitat, Jean-Claude, to Rhone-Poulenc Industries. Process for dry-cleaning or de-oiling by means of a perchloroethylene base composition. 4,220,448, Cl. 8-142.000.

Cotrel, Claude; Jeanmart, Claude; Messer, Mayer N.; and Crisan, Cornel, to Rhone-Poulenc Industries. Heterocyclic compounds. 4,220,646, Cl. 424-250.000.

Cotton, Incorporated: *See—*
Winch, Allen R.; and Chewning, Charles H., Jr., 4,219,908, Cl. 19-99.000.

Coulter Electronics, Inc.: *See—*
Simpson, Ronald O.; and Cabrera, Pedro P., 4,220,621, Cl. 422-103.000.

Country Log Homes, Inc.: *See—*
Bene, Robert; Fortini, Joseph A.; and Giacomini, Maximiliano, 4,219,977, Cl. 52-94.000.

Coursen, David L.; and Cowan, George R., to Du Pont de Nemours, E. I., and Company. Method of producing self-propping fluid-conductive fractures in rock. 4,220,205, Cl. 166-299.000.

Coutenceau, Francois: *See—*
Abeille, Jean; Coeuillet, Jacques; Coutenceau, Francois; and Grandfils, Claude, 4,220,004, Cl. 60-413.000.

Cowan, George R.: *See—*
Coursen, David L.; and Cowan, George R., 4,220,205, Cl. 166-299.000.

Cowen, Steven J., to United States of America, Navy. Fiber optic light launching assembly. 4,220,411, Cl. 356-73.100.

Coyne, Brenton S., to Dow Chemical Company, The. Crosslinked chlorinated polyethylene foam. 4,220,730, Cl. 521-143.000.

Craft, Jack, to RCA Corporation. AFT circuit. 4,220,974, Cl. 358-195.100.

Cragoe, Edward J., Jr.: *See—*
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,220,654, Cl. 424-273.00R.

Crase, Gary M.; Trezeciak, Kurt H.; and Tschirky, John E., to Smith International Inc. Bearing assembly. 4,220,380, Cl. 308-174.000.

Crisan, Cornel: *See—*
Cotrel, Claude; Jeanmart, Claude; Messer, Mayer N.; and Crisan, Cornel, 4,220,646, Cl. 424-250.000.

Crossland, John S.; Grimstead, David; and Guy, Simon P., to St. Clair Fisheries Ltd. Treatment of fish. 4,219,906, Cl. 17-46.000.

Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. Diphenylphthalide duplicating and marking systems. 4,220,357, Cl. 282-27.500.

Crouse-Hinds Company: *See—*
Matteo, Gene T.; and Sensinger, Wilbur A., 4,220,986, Cl. 362-362.000.

Crow, John D.: *See—*
Wang, Shyh; Shah, Manhar L.; and Crow, John D., 4,220,395, Cl. 350-96.120.

Crowley, Joseph M., to Xerox Corporation. Ink jet electrohydrodynamic exciter. 4,220,958, Cl. 346-75.000.

Crush, Roy D., Jr. Pulling line sport apparatus. 4,220,328, Cl. 272-116.000.

Cseh, Georg; Roueche, Armand; and Hari, Stefan, to Ciba-Geigy Corporation. Hetero-aryl azo acylamino substituted aceto-acetarylide pigments. 4,220,586, Cl. 260-157.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Castriotta, Michele; and De Micheli, Spiridione, 4,220,824, Cl. 179-18.00J.

Cueto, Ronald E.; and Cohen, Arthur N. Adjustable hanging device. 4,220,306, Cl. 248-328.000.

Cummins Engine Company: *See—*
Wilber, Dennis A.; and Schnapp, John P., 4,220,008, Cl. 60-602.000.

Cummins, James M.; and Pierfelice, Gilbert E. Therapeutic apparatus. 4,220,143, Cl. 128-33.000.

Cummins, Laurence M.: *See—*
Hixson, Harry F., Jr.; Green, Billy J.; Cummins, Laurence M.; and Cole, John W., 4,220,598, Cl. 260-397.100.

Cutts, Edmund A. Combination vaporized driving fluid generator and engine unit. 4,220,005, Cl. 60-514.000.

Cyclonaire Corporation: *See—*
Jacobson, Wayne M., 4,220,425, Cl. 406-86.000.

Cyklop-Gesellschaft Emil Hoffman: *See—*
Wehr, Hubert; and Schlosser, Karl-Heinz, 4,220,493, Cl. 156-380.000.

Cytron Incorporated: *See—*
Glover, Clinton G.; and Keller, Harold A., 4,220,130, Cl. 124-7.000.

D. W. A. Associates: *See—*
Brouthers, Paul E., 4,219,954, Cl. 42-67.000.

Dale, Jim E., to United States of America, Agriculture. Rope wick applicator. 4,219,964, Cl. 47-1.500.

Dalgoutte, David G., to International Standard Electric Corporation. Jeweled optical fiber connector. 4,220,398, Cl. 350-96.210.

Dalton, David R.: *See—*
Wong, Chung-Chee; and Dalton, David R., 4,220,304, Cl. 248-231.000.

Dana Corporation: *See—*
Shah, Kanu G., 4,220,342, Cl. 277-228.000.
Williams, James A., 4,220,912, Cl. 324-51.000.

Dango & Dienenthal Maschinebau GmbH: *See—*
Brucher, Eberhard, 4,220,321, Cl. 266-271.000.

Dankman, Scott; Levy, Richard C.; and McCoy, Bryan L., to Scienco, Inc. Toy vehicle. 4,219,962, Cl. 46-232.000.

Danti, Bernard R. Precision cutting means. 4,220,272, Cl. 225-2.000.

Dapco Industries, Inc.: *See—*
Sholl, Howard A.; and Marshall, John T., 4,220,049, Cl. 73-636.000.

Darf Corporation: *See—*
Henry, Albert R., Sr., 4,219,992, Cl. 56-119.000.

Date, Sukeaki; and Ebato, Seigo, to Mitsubishi Paper Mills, Ltd. Photographic polypropylene coated paper support with corona discharge treatment and polymeric subbing layer. 4,220,471, Cl. 430-532.000.

Daude-Lagrave, Marie-Christine, to Produits Chimiques Ugine Kuhlmann. Oxidative purification of water. 4,220,529, Cl. 210-758.000.

Davis, Robert B.: *See—*
Coplan, Myron J.; Beale, John H.; and Davis, Robert B., 4,220,489, Cl. 156-73.600.

Davitt, James J., Jr. Adjustable height gauge device. 4,219,934, Cl. 33-168.00B.

DBX, Inc.: *See—*
Talbot, Daniel B.; and Blackmer, David E., 4,220,929, Cl. 330-136.000.

Debaigt, Jean, to Societe Anonyme dite: CGEE ALSTHOM. Terminal block for ground conductors. 4,220,392, Cl. 339-198.00N.

Dechelette, Helen. Electrical connector and contact and housing therefor. 4,220,388, Cl. 339-74.00R.

de Cointet de Fillain, Paul: *See—*
Bazile, Yves; de Cointet de Fillain, Paul; and Pigerol, Charles, 4,220,793, Cl. 549-68.000.

Deem, Calvin K., to Combustion Engineering, Inc. Separation of hydrogen sulfide from fluid streams. 4,220,505, Cl. 204-94.000.

Deere & Company: *See—*
Trott, Clarence R.; Veldhoven, Gerardus A.; and Chadwick, Dennis P., 4,220,280, Cl. 239-1.000.

Defibrator Aktiebolag: *See—*
Johansson, Johan G. I., 4,220,290, Cl. 241-247.000.

Deflin, Michel: *See—*
Anquetil, Jean-Pierre; Deflin, Michel; Clement, Jean-Claude; and Neel, Emmanuel E. A., 4,220,560, Cl. 252-468.000.

Degelman Industries Ltd.: *See—*
Degelman, Wilfred J., 4,220,210, Cl. 172-276.000.

Degelman, Wilfred J., to Degelman Industries Ltd. Tractor front supported implement attachment frame. 4,220,210, Cl. 172-276.000.

DeGidio, George J. Swinging door unit for a doghouse. 4,219,970, Cl. 49-388.000.

Degner, Vernon R.; and Colbert, William V., to Envirotech Corporation. Flotation cell feed duct. 4,220,612, Cl. 261-76.000.

DeGray, William G. Automatic bread feeder. 4,220,241, Cl. 198-408.000.

de Kreuk, Casper W., to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer. Apparatus for automatically determining the amount of one or more substances in a liquid. 4,220,515, Cl. 204-195.00H.

De Leon, Noel, to Topsil A/S. Induction heating coil for float zone melting of semiconductor rods. 4,220,839, Cl. 219-10.49R.

Delpy, David T.; and Parker, Dawood, to Medishield Corporation Limited, The. Transcutaneous probe. 4,220,158, Cl. 128-632.000.

Deluxe Check Printers, Inc.: *See—*
Hawkinson, Warren S., 4,220,081, Cl. 101-93.110.

DeMaagd, Donald R., to Oreck Corporation. Vacuum cleaning. 4,219,902, Cl. 15-364.000.

deMauriac, Richard A., to Eastman Kodak Company. Heat developable imaging materials and process. 4,220,709, Cl. 430-353.000.

De Micheli, Spiridione: *See—*
Castriotta, Michele; and De Micheli, Spiridione, 4,220,824, Cl. 179-18.00J.

Demikhovsky, Vladimir G.: *See—*
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Dempf, Dominik; Knabl, Rudolf; Schmidhammer, Ludwig; and Mack, Wilhelm, to Wacker-Chemie GmbH. Stabilized perchloroethylene. 4,220,607, Cl. 260-652.50R.

den Hollander, Willem, to RCA Corporation. Raster distortion correction circuit. 4,220,898, Cl. 315-371.000.

Denka Chemical Corporation: *See—*
Perrone, Rosario J., 4,220,574, Cl. 260-23.70H.

Derbyshire, Rodney L., to Radiation Dynamics, Inc. Treatment of sintered poly-tetrafluoroethylene with irradiation and heat to produce a grindable material. 4,220,511, Cl. 204-159.200.

Deryagin, Boris V.: *See—*
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.

de San, Maurice G. Method of manufacturing building panels. 4,219,984, Cl. 52-741.000.

Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, to Institut Francais du Petrole. Process for converting ammonium imidodisulfate, ammonium sulfamate and ammonium dithionate to sulfur dioxide and ammonia. 4,220,634, Cl. 423-356.000.

Desert Merchandising, Inc.: *See—*
Fields, Murray E., 4,220,666, Cl. 426-62.000.

DeSoto, Inc.: *See—*
Brook, Richard L., 4,220,686, Cl. 428-375.000.

Deutsch, Alina; Kryder, Mark H.; and Nystrom, Walter, to International Business Machines Corporation. Improved bubble domain storage array. 4,221,000, Cl. 365-2.000.

Deutsche Gesellschaft fuer Unwelt-Schutz e. V.: *See—*
Duscher, Renate-Else, 4,220,636, Cl. 424-14.000.

DeWitt, Nick R., to Railcar Maintenance Company. Trailer mounted apparatus for hauling railroad wheels. 4,220,437, Cl. 414-549.000.

Dezael, Claude: *See—*
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,220,634, Cl. 423-356.000.

Diamond, Julius: *See—*
Douglas, George H.; and Diamond, Julius, 4,220,658, Cl. 424-304.000.

Dickason, Alan F.; and Cherry, Wesley R., to Sun Ventures, Inc. Oxidation of butane to maleic anhydride. 4,220,595, Cl. 260-346.750.

Didier-Werke AG: *See—*
Fehling, Hans R., 4,220,268, Cl. 222-600.000.

Dieck, Ronald L.; and Wambach, Allen D., to General Electric Company. Modified polyester compositions. 4,220,735, Cl. 525-90.000.

Diesel Kiki Co., Ltd.: *See—*
Kobayashi, Masayoshi, 4,220,128, Cl. 123-366.000.

Dietrich, Ralph N.: *See—*
Howell, Stephen L.; Dietrich, Ralph N.; Robinson, John W.; and Osburn, James P., 4,220,068, Cl. 84-1.030.

Dillhofer, Heinz: *See—*
Meiser, Gerd; and Dillhofer, Heinz, 4,220,430, Cl. 409-231.000.

Di Palma, Ralph B.; and Loh, Anthony, Jr., to P. R. Mallory & Co. Inc. Composite separator/absorbent. 4,220,693, Cl. 429-133.000.

DiPaola, Donald A., to Allied Chemical Corporation. Safety belt retractor. 4,220,294, Cl. 242-107.40A.

Dipl. Ing. A. Berglein: *See—*
Schmidt, Otto, 4,219,951, Cl. 40-530.000.

Director General of Agency of Industrial Science and Technology: *See—*
Imamura, Juichi, 4,220,605, Cl. 568-432.000.

Diversified Manufacturing & Marketing Co., Inc.: *See—*
Pope, George F.; and Childress, Evelyn O., 4,220,949, Cl. 340-533.000.

Diversified Packaging, Incorporated: *See—*
Hannon, James V., 4,219,987, Cl. 53-427.000.

Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft: *See—*
Franzen, Jochen; and Weiss, Gerhard, 4,220,545, Cl. 250-530.000.

Doi, Kiyoshi. Apparatus for generating rotational power. 4,220,003, Cl. 60-325.000.

Dombay, Zsolt; Grega nee Toth, Erzsebet; Havelka, Ferenc; and Kovasznay, Anna, to Eszakmagyarorszagi Vegyimuvek. Composition and method for combatting weeds in cereals. 4,220,467, Cl. 71-93.000.

Domglas Inc.: *See—*
Levene, Leon; and McClung, R. Wayne, 4,220,118, Cl. 118-720.000.

Dornier System GmbH: *See—*
Pimiskern, Klaus; and Herbert, Werner, 4,220,379, Cl. 308-36.000.

Dorsey, Robert J.; Okunami, Hideo; and Savage, William T., to Wehr Corporation. Press apparatus including plunger adjustment means. 4,220,442, Cl. 425-344.000.

Dosoudil, Martin, to Amafilter BV. Apparatus for filtering liquids. 4,220,536, Cl. 210-325.000.

Douglas, George H.; and Diamond, Julius, to William H. Rorer, Inc. Treatment of hypertension with amidinoureas. 4,220,658, Cl. 424-304.000.

Dover Corporation: *See—*
Gingrich, John A., 4,220,221, Cl. 187-29.00R.

Dover Corporation (Canada) Limited: *See—*
Gingrich, John A., 4,220,221, Cl. 187-29.00R.

Dow Chemical Company, The: *See—*
Constien, Vernon G.; and Clark, Peter E., 4,220,566, Cl. 260-13.000.
Coyne, Brenton S., 4,220,730, Cl. 521-143.000.
Frenier, Wayne W.; Coffey, Michael D.; Huffines, James D.; and Smith, Donald C., 4,220,550, Cl. 252-180.000.
Kresta, Jiri; and Shen, Chen S., 4,220,728, Cl. 521-121.000.
McCarty, Leslie P.; and Larsen, Eric R., 4,220,664, Cl. 424-342.000.
Walles, Wilhelm E., 4,220,739, Cl. 525-344.000.

Draghiccio, Pietro; and Villa, Enrico, to Rockwell-Rimoldi S.p.A. Looper control apparatus for sewing machines. 4,220,102, Cl. 112-200.000.

Dragoco Gerberding & Co GmbH: *See—*
Klein, Erich, 4,220,665, Cl. 424-343.000.

Dresback, David S., to Pfizer Inc. Delivery system. 4,220,152, Cl. 128-260.000.

Dresback, David S., to Pfizer Inc. Controlled release delivery system. 4,220,153, Cl. 128-260.000.

Dresser Industries, Inc.: *See—*
Javora, Paul H.; and Green, Bethel Q., 4,220,585, Cl. 260-124.00R.
Phelps, Francis E., 4,220,377, Cl. 308-8.200.

Drummond, James E., to Maxwell Laboratories, Inc. Dielectric thermal power converter. 4,220,906, Cl. 322-2.00A.

Dubois, Claude; and Surdi, Jean M., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device to balance a rotor. 4,220,055, Cl. 74-573.00R.

Duchemin, Jean-Pascal; Leguen, Daniel; Bonnet, Michel; Koelsch, Francois; and Beuchet, Gerard, to Thomson-CSF. Gas-phase process for the production of an epitaxial layer of indum phosphide. 4,220,488, Cl. 148-175.000.

Duchene, Jacques; and Meyer, Robert. Electrode for an electrolytic cell particularly for electrolytic display cells and process of manufacture. 4,220,514, Cl. 204-192.00P.

Dummer, Merlin R., to Eaton Corporation. Half and full wave energizing system for permanent magnet D.C. motors. 4,220,901, Cl. 318-348.000.

Dumser, Paul J.: *See—*
Wempe, Richard J.; and Dumser, Paul J., 4,220,097, Cl. 105-360.000.

Duncan, Angus D.: *See—*
Hargreaves, Brian; and Duncan, Angus D., 4,220,066, Cl. 83-886.000.

Duneczky, Francis: *See—*
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,220,581, Cl. 260-402.500.

Dunham-Bush, Inc.: *See—*
Schaefer, Donald D.; Shaw, David N.; and Gagnon, Joseph A. M., 4,220,197, Cl. 165-35.000.

Dunn, Nancy G.: *See—*
Hughes, James W.; Kudchadker, Mohan V.; and Dunn, Nancy G., 4,220,204, Cl. 166-274.000.

Du Pont de Nemours, E. I., and Company: *See—*
Cheng, Jiin-Duey, 4,220,465, Cl. 71-90.000.
Coursen, David L.; and Cowan, George R., 4,220,205, Cl. 166-299.000.
Feiring, Andrew E., 4,220,608, Cl. 260-653.300.
Jones, Richard H., 4,220,733, Cl. 525-66.000.
Schell, Mark S., 4,220,389, Cl. 339-74.00R.
Whitney, Joel G.; and Hermann, Edward C., 4,220,776, Cl. 546-83.000.

Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., to Smith Kline & French Laboratories Limited. Isothiazolyl alkylaminoethylene compounds. 4,220,652, Cl. 424-270.000.

Durkow, Carl J.: *See—*
Wesson, Laurence N.; and Durkow, Carl J., 4,220,943, Cl. 338-42.000.

Dursch, Walter; and Linke, Fritz, to Hoechst Aktiengesellschaft. Organic phosphorus compounds with 2-hydroxyalkyl-phosphonic acid groups. 4,220,610, Cl. 260-928.000.

Duscher, Renate-Else, to Deutsche Gesellschaft fuer Unwelt-Schutz e. V. Stabilized suppositories containing ergo-alkaloids. 4,220,636, Cl. 424-14.000.

Dwan, Thomas S., to Beringer Co., Inc. Process for vacuum pyrolysis removal of polymers from various objects. 4,220,480, Cl. 134-5.000.

Dyer, Robert F., to Hoover Company, The. Pivoting nozzle duct. 4,219,900, Cl. 15-339.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Rohlfing, Wolfgang; and Vanheiden, Peter, 4,220,572, Cl. 260-45.95L.

E. R. Squibb & Sons, Inc.: *See—*
Rovnyak, George C., 4,220,791, Cl. 548-367.000.
Sprague, Peter W., 4,220,594, Cl. 260-345.900.

Eagle Research and Development, Inc.: *See—*
Place, Eugene W.; and Williams, David M., 4,220,431, Cl. 414-35.000.

Eapen, Kuttikandathil E.: *See—*
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,220,671, Cl. 426-321.000.

Eastman Kodak Company: *See—*
deMauriac, Richard A., 4,220,709, Cl. 430-353.000.
Lambeth, David N., 4,220,971, Cl. 358-160.000.
McGuckin, Hugh G.; and Cohen, Hyman L., 4,220,700, Cl. 430-143.000.
Shroyer, Richard A.; and Martin, William A., 4,220,412, Cl. 356-218.000.
Smith, John E., 4,220,323, Cl. 271-65.000.

Eaton Corporation: *See—*
Dummer, Merlin R., 4,220,901, Cl. 318-348.000.

Ebata, Sadao, to Kawasaki Steel Corporation. Device and method for measuring the profile of a plate. 4,220,043, Cl. 73-159.000.

Ebato, Seigo: *See—*
Date, Sukeaki; and Ebato, Seigo, 4,220,471, Cl. 430-532.000.

Ebihara, Isao: *See—*
Baba, Toshiyuki; Ebihara, Isao; and Minegishi, Masatoshi, 4,220,500, Cl. 162-127.000.

Eckes, Helmut: *See—*
Erckel, Rudiger; Schmidt, Erwin; Eckes, Helmut; and Rosch, Guter, 4,220,760, Cl. 542-460.000.

Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Enzymatic treatment of proteinaceous animal waste products. 4,220,723, Cl. 435-265.000.

Eckmayer, Zdenek: *See—*
Berg, Alexander; Eckmayer, Zdenek; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,724, Cl. 435-273.000.

Eddy Oxford Enterprises Limited: *See—*
Paladino, Anthony, 4,219,947, Cl. 37-193.000.

Edgawa, Hiroshi; Fujita, Toshinori; and Uesugi, Yasuo, to Toray Industries, Inc. Multi-component spun yarn. 4,219,996, Cl. 57-225.000.

Edwards, Richard A., to Esselte Pendaflex Corporation. Print wheel selection mechanism. 4,220,082, Cl. 101-93.220.

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Roth, Walter L.; and Mitoff, Stephan P., 4,220,691, Cl. 429-104.000.

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Schafer, Curtiss R., 4,220,830, Cl. 179-107.00R.
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Howell, Mark I.; and Sole, Lloyd H., 4,220,913, Cl. 324-52.000.
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Fischbein, Miklos; and Benedek, Herman, 4,219,919, Cl. 29-270.000.
Elfab Corporation: *See—*
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Grable, Jack W., 4,220,938, Cl. 337-89.000.
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Polinski, Leon M., 4,220,559, Cl. 252-455.00R.
Engelsmann, Dieter: *See—*
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Degner, Vernon R.; and Colbert, William V., 4,220,612, Cl. 261-76.000.
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Coliva, Luigi, 4,219,942, Cl. 34-203.000.
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Shay, Joseph J., 4,220,265, Cl. 222-402.200.
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EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschloessern Gesellschaft m.b.H. Kommanditgesellschaft: *See—*
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Barlow, Roland J.; and Smith, Gary M., 4,220,053, Cl. 74-425.000.
Explosive Technology, Inc.: *See—*
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Carter, James L.; and Sinfelt, John H., 4,220,520, Cl. 208-139.000.
Oswald, Alexis A.; and Murrell, Lawrence L., 4,220,556, Cl. 252-430.000.
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Touborg, Jorn, 4,220,476, Cl. 106-100.000.
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Farnhill, William M., to Platt Saco Lowell Limited. Apparatus for twisting a strand. 4,219,998, Cl. 57-293.000.
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Faulkner, Albert A., to SmithKline Corporation. Device for separating a microscope slide into two separate sections. 4,220,273, Cl. 225-96.500.
Faustini, Franco: *See—*
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Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., to Institut Sverkhtverdykh Materialov Akademii Nauk Ukrainskoi SSR. Polycrystalline superhard material and method of producing thereof. 4,220,677, Cl. 427-215.000.
Fehling, Hans R., to Didier-Werke AG. Self supporting refractory sliding plate. 4,220,268, Cl. 222-600.000.
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Feiring, Andrew E., to Du Pont de Nemours, E. I., and Company. Preparation of 3,3,3-trifluoropropene-1. 4,220,608, Cl. 260-653.300.
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Feldstein, Nathan. Dispersions for activating non-conductors for electroless plating. 4,220,678, Cl. 427-305.000.
Felix, Raymond A., to Stauffer Chemical Company. 7,7-Dichloro-bicycloheptane imide compounds and their use as biocides. 4,220,656, Cl. 424-274.000.
Fender, C. Leo. Electromagnetic pickup for stringed musical instruments. 4,220,069, Cl. 84-1.150.
Fennell Corporation: *See—*
James, William L.; and Staudenmaier, Hans J., 4,220,445, Cl. 432-250.000.
Ferrigan, Paul J., to Saratoga Sunroof Corporation. Removable plastic roof panel. 4,220,368, Cl. 296-215.000.
Feterl, Leon G., to SOS Consolidated, Inc. Sweep auger drive system. 4,220,433, Cl. 414-298.000.
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Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of 4,6-dihalogeno-triazines. 4,220,765, Cl. 544-179.000.
Fink, William H.: *See—*
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Bohm, Georg G. A.; and Nelson, Charles J., 4,220,512, Cl. 204-159.120.
Firmenich SA. *See—*
Winter, Max, deceased; and Mottu, Pierre, executor, 4,220,561, Cl. 252-522.00R.
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Fischer, Hermann, to M.A.N.-Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Bearer ring-press cylinder connection construction for rotary printing machine. 4,220,083, Cl. 101-216.000.
Fischer, Kurt: *See*—
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Fisher, Chester G., III: *See*—
Targowski, Roger W.; and Fisher, Chester G., III, 4,220,413, Cl. 356-315.000.
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Flath, Wolfgang. Information carrier. 4,219,952, Cl. 40-622.000.
Fleischer, Charles J. Toy egg. 4,219,959, Cl. 46-1.00R.
Fleischer, Henry. Collapsible frames for baby carriers. 4,220,351, Cl. 280-647.000.
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Hamilton, David C.; and Fleming, Joseph W., 4,220,881, Cl. 310-184.000.
Flexi-Group, Inc., The: *See*—
Bromberg, Howard M., 4,220,075, Cl. 93-1.00F.
Flugger, Ray T. Lightweight muffler and method for muffling noise. 4,220,219, Cl. 181-265.000.
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Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,220,846, Cl. 219-381.000.
FMC Corporation: *See*—
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Tarum, Arden V.; and Scherbel, Gordon H., 4,220,317, Cl. 266-45.000.
Thorne, Paul M., 4,220,421, Cl. 405-211.000.
Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Apparatus for thermal sealing the ends of a stack of foil wrapped packages. 4,220,847, Cl. 219-388.000.
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Fogarty, John E., to Slater Steel Industries Limited. Method of continuously casting steel. 4,220,191, Cl. 164-57.000.
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Prohaska, Helmut; Reiterer, Franz; Bretthauer, Klaus; and Kloss, Helmut, 4,220,484, Cl. 148-6.300.
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Forsberg, Georg L. K. Screw conveyor with intermediate bearing. 4,220,242, Cl. 198-666.000.
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Foster, Joseph J., Jr.; and Schneider, Walter C., to Superior Switchboard & Devices Division of The Union Metal Manufacturing Co. Latch for meter box. 4,220,363, Cl. 292-164.000.
Foster, Keith D.: *See*—
Foster, Marvin L.; and Foster, Keith D., 4,220,365, Cl. 293-128.000.
Foster, Marvin L.; and Foster, Keith D. Vehicle body molding assembly. 4,220,365, Cl. 293-128.000.
Fouassier, Claude; Garcia, Alain; and Latourrette, Bertrand, to Rhone-Poulenc Industries. Novel blue light emitting luminophors. 4,220,551, Cl. 252-301.40F.
Foundation: The Research Institute for Special Inorganic Materials, The: *See*—
Yajima, Seishi; Okamura, Kiyohito; and Hasegawa, Yoshio, 4,220,600, Cl. 556-434.000.
Fox, Brian G.: *See*—
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Foxboro Company, The: *See*—
Gross, Thomas A. O., 4,220,920, Cl. 324-442.000.
Sqourakes, George E., 4,220,046, Cl. 73-861.220.
Francia, Giovanni. Solar receiver. 4,220,140, Cl. 126-446.000.
Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., to Biomedical International Company. Electrode. 4,220,159, Cl. 128-639.000.
Franckowiak, Sigismond: *See*—
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,220,634, Cl. 423-356.000.
Frank, Kjell: *See*—
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Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,220,846, Cl. 219-381.000.
Franko, Joseph P.; and Marchetti, Michael J., to Remington Products, Inc. Cutter head assembly for an electric dry shaver. 4,219,930, Cl. 30-43.920.
Franzen, Jochen; and Weiss, Gerhard, to Dr. Franzen Analysentechnik GmbH & Co. Kommanditgesellschaft. Ionization chamber for chemical ionization. 4,220,545, Cl. 250-530.000.
Frazier, Albert A., to Aladdin Industries, Incorporated. Apparatus for making a vacuum insulated container. 4,220,462, Cl. 65-153.000.
Fredriksen, Knud V. Cleaning apparatus for hose filters. 4,220,457, Cl. 55-273.000.
Freebairn, Hugh T.; and McDonnell, Jerry F., to Catalytic Generators, Inc. Frost damage prevention in plant tissue. 4,219,965, Cl. 47-2.000.
Freedman, Robert P.: *See*—
Pappas, Dennis G.; Baum, Matthew C.; Small, Samuel N.; Adams, Robert T.; and Freedman, Robert P., 4,220,907, Cl. 322-3.000.
Freeman, Harold, to Harold Freeman Jewelry Mfg. Co., Inc. Convertible finger ring. 4,220,017, Cl. 63-15.000.
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Block, William V., 4,220,456, Cl. 55-85.000.
Frenger, Rita K. Skin jewelry. 4,220,016, Cl. 63-2.000.
Frenier, Wayne W.; Coffey, Michael D.; Huffines, James D.; and Smith, Donald C., to Dow Chemical Company, The. Composition and method for removing sulfide-containing scale from metal surfaces. 4,220,550, Cl. 252-180.000.
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Friden, Lars: *See*—
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Friesen, Larry D.; and Palmer, Stephen L., to Towmotor Corporation. Control system actuating assembly. 4,220,050, Cl. 74-2.000.
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Frye, Eugene O., to Rockwell International Corporation. RF coupling device for connecting a hand held radio to an external device without removing the antenna. 4,220,955, Cl. 343-703.000.
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Fuji Photo Film Co., Ltd.: *See*—
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Nakamura, Kotaro; and Mitsui, Akio, 4,220,711, Cl. 430-507.000.
Nakamura, Kotaro; and Mitsui, Akio, 4,220,711, Cl. 430-507.000.
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Fujisawa Pharmaceutical Co., Ltd.: *See*—
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Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,220,761, Cl. 544-27.000.
Fujita, Kohei; Owan, Youichi; and Ozawa, Minoru, to Nippon Petroleum Refining Company, Limited. Method of suppressing the rise in surface temperature of heating tubes by ammonia injection. 4,220,519, Cl. 208-48.0AA.
Fujita, Teizo, to Izumi Denki Corporation. Mounting device for compact apparatus. 4,220,808, Cl. 174-48.000.
Fujita, Toshinori: *See*—
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Kikumoto, Ryoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,220,603, Cl. 260-570.700.
Fukushima, Hiroshi: *See*—
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Fukutomi, Naoki; Tsuru, Yoshiyuki; Kawaguchi, Kunio; and Naoyuki, Susumu, to Hitachi Chemical Company, Ltd. Method of producing a multistylus head device. 4,219,927, Cl. 29-850.000.
Fuller, Derek E., to St. Clair Fisheries. Treatment of fish. 4,219,907, Cl. 17-46.000.
Fulop, Ferenc: *See*—
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Furutachi, Nobuo; Nakamura, Kotaro; Arai, Atsuaki; Yamada, Minoru; and Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Silver halide material containing photographic magenta coupler. 4,220,470, Cl. 430-387.000.
Furuya, Katsusuke, to Laurel Bank Machine Co., Ltd. Apparatus in a coin packaging machine for treating coins which are accumulated out of alignment. 4,220,169, Cl. 133-8.00A.

Futterknecht, Kuno: *See—*
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G. D. Searle & Co.: *See—*
Ellefson, Charles R.; and Prodan, Kathleen, 4,220,778, Cl. 546-150.000.
Gabriele, Raymond S. Fish tank filter. 4,220,530, Cl. 210-86.000.
Gaffney, Edward N., to Lucas Industries Limited. Pipe coupling. 4,220,358, Cl. 285-242.000.
Gagnepain, Jean-Jacques; Hauden, Daniel; Pegeot, Claude; and Michel, Monique, to Quartz et Electronique. Double and triple rotated quartz plates for surface waves. 4,220,888, Cl. 310-361.000.
Gagnon, Joseph A. M.: *See—*
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Gale, Thomas C.; Graves, Richard A.; and Lobanoff, Mark, to Chrysler Corporation. Vehicle removable security curtain. 4,220,367, Cl. 296-37.160.
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Gamadia, Rustom K., to Lever Brothers Co. Pump dispensers. 4,220,264, Cl. 222-207.000.
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, to Carlo Erba S.p.A. 13,14-Dehydro-11-deoxy-prostaglandins and process for their preparation. 4,220,759, Cl. 542-426.000.
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Fouassier, Claude; Garcia, Alain; and Latourrette, Bertrand, 4,220,551, Cl. 252-301.40F.
Garrett Corporation, The: *See—*
Burch, Darrel W.; and Wojciehowski, James P., 4,220,439, Cl. 415-9.000.
Gashenko, Stanislav I.: *See—*
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.
Gass, Karl, to Ciba-Geigy Corporation. Triazine compounds. 4,220,770, Cl. 544-208.000.
Gatley, Thomas W., to Bundaberg Foundry Company Limited, The. Mill roller controlling apparatus. 4,220,288, Cl. 241-37.000.
Gaussin, Henri. Trailer vehicle. 4,220,349, Cl. 280-116.000.
Gawron, Klaus; Mahdjuri, Faramarz; and Schroder, Johann, to U.S. Philips Corporation. Heat storage device. 4,220,196, Cl. 165-11.00R.
Geberth, John D., Jr. Adjustable spray tip. 4,220,286, Cl. 239-455.000.
Gebruder Linck Maschinenfabrik und Eisen/Giesserel Gatterlinck, Firma: *See—*
Traben, Josef, 4,220,185, Cl. 144-3.00P.
Geen, David T.: *See—*
Walker, Reginald J.; and Geen, David T., 4,220,078, Cl. 98-115.0SB.
Gegenhuber, Peter, to Harris, Michael J. Closure assemblies. 4,220,267, Cl. 222-520.000.
Gehl Company: *See—*
Mast, James W.; Martin, Virgil B.; and Villers, Roger L., 4,220,019, Cl. 64-28.00R.
Gename, John L., to Richco Plastic Company. Hose carrier. 4,220,293, Cl. 242-86.100.
Gendelman, Bernard: *See—*
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General Electric Company: *See—*
Britt, Pope P., 4,220,957, Cl. 343-756.000.
Byrne, Michael, 4,220,862, Cl. 250-384.000.
Carnahan, James C., 4,220,805, Cl. 568-592.000.
Dieck, Ronald L.; and Wambach, Allen D., 4,220,735, Cl. 525-90.000.
Fey, Robert M.; and Shekar, Hiriyur V., 4,220,232, Cl. 192-103.00B.
Mark, Victor, 4,220,583, Cl. 260-45.70S.
McEntee, Harry R.; and Potochnik, Frank S., 4,220,609, Cl. 260-657.000.
Powell, David B., 4,220,936, Cl. 335-166.000.
St. Pierre, Philippe D.; Morelock, Charles R.; and Birle, John D., 4,220,455, Cl. 51-295.000.
Shade, Russell L., Jr.; Reed, William G.; and Mazer, Jack S., 4,220,194, Cl. 165-1.000.
Snyder, Paul V., 4,220,134, Cl. 126-390.000.
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General Motors Corporation: *See—*
Cataldo, Roy S.; and Salamon, Theodore M., 4,220,354, Cl. 280-803.000.
Riddel, John W., 4,220,218, Cl. 180-176.000.
Genossenschaft Vebo Solothurnische Eingliederungsstatte fur Behinderte, Oensingen, Aarmatt: *See—*
Hauri, Hermann, 4,220,251, Cl. 215-365.000.
Geokezas, Meletios; Larson, Rodney M.; and Serreyn, David V., to Honeywell Inc. Low contrast object extraction device. 4,220,972, Cl. 358-166.000.
Gerasimenko, Valentin K.: *See—*
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.
Gerritsen, Jan: *See—*
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Geschwender, Robert C., to Concept Engineering Inc. Utility cart. 4,220,346, Cl. 280-47.180.
Gewerkschaft Eisenhutte Westfalia: *See—*
Merten, Gerhard, 4,220,371, Cl. 299-18.000.
Giacomini, Maximiliano: *See—*
Bene, Robert; Fortini, Joseph A.; and Giacomini, Maximiliano, 4,219,977, Cl. 52-94.000.
Giannini, Giuliano: *See—*
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Gibson, William A.; and Talmage, John E., Jr., to Elographics, Inc. Nonplanar transparent electrographic sensor. 4,220,815, Cl. 178-18.000.
Gilger, Douglas D., II. Hay gathering apparatus. 4,220,436, Cl. 414-434.000.
Gill, William A., to FMC Corporation. Offshore loading system with articulated manifolds. 4,220,177, Cl. 137-615.000.
Gingrich, John A., to Dover Corporation; and Dover Corporation (Canada) Limited. Method and apparatus for producing a speed pattern for an elevator car or similar vehicle. 4,220,221, Cl. 187-29.00R.
Giordano, Raymond L., to RCA Corporation. Temperature compensated switching circuit. 4,220,873, Cl. 307-254.000.
Giordano, Raymond L., to RCA Corporation. Temperature compensated switching circuit. 4,220,877, Cl. 307-310.000.
Givaudan Corporation: *See—*
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,220,577, Cl. 260-29.6MN.
Gladwin, Kirk M. Combined roller support and spray cooling system for continuous casting molds. 4,220,192, Cl. 164-89.000.
Glindmeyer, Friedrich; Limpens, Karl; and Hennenberg, Wilhelm F., deceased (by Hennenberg, Anneliese, heir), to Yoshida Kogyo K.K. Woven fastener stringer. 4,220,182, Cl. 139-384.00B.
Glover, Clinton G.; and Keller, Harold A., to Cytron Incorporated. Spring type ball throwing machine. 4,220,130, Cl. 124-7.000.
Godlewski, Robert E., to Union Carbide Corporation. Method of molding polyurethanes having mold release properties. 4,220,727, Cl. 521-110.000.
Goedecke, Hans: *See—*
Sauerwein, Kurt; and Goedecke, Hans, 4,220,864, Cl. 250-497.000.
Goethals, Rafael A. J.: *See—*
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Gokcek, Cetin, to Messer Griesheim GmbH. Patentabteilung. Steel cylinder for the storage of gas mixtures. 4,220,183, Cl. 141-1.000.
Goldner, Walther: *See—*
Strien, Werner; Goldner, Walther; and Venieris, George J., 4,220,308, Cl. 248-424.000.
Goodnight, Hershel E.: *See—*
Reed, Robert D.; and Goodnight, Hershel E., 4,220,444, Cl. 431-348.000.
Goodrich, William M.: *See—*
Green, William A.; Goodrich, William M.; and Long, David R., 4,220,295, Cl. 242-170.000.
Goodwin, Perry H., Jr.: *See—*
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Gopalakrishnan, Sankaraiyer: *See—*
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Gould Inc.: *See—*
Evenson, James E.; Kleckner, Richard M.; and Ma, James W., 4,220,359, Cl. 285-249.000.
Gozzo, Franco; Boschi, Pier Marino; and Longoni, Angelo, to Montedison S.p.A. Phosphoric esters derived from 1,2,4-triazole having an insecticidal, nematocidal and acaricidal action, and their preparation. 4,220,789, Cl. 548-263.000.
Grable, Jack W., to Emerson Electric Co. Thermostatic electrical switch. 4,220,938, Cl. 337-89.000.
Grable, Jack W., to Emerson Electric Co. Thermal responsive electrical switching device and calibration method therefor. 4,220,939, Cl. 337-94.000.
Graeff, Norwood C.: *See—*
Cobaugh, Robert F.; and Graeff, Norwood C., 4,220,390, Cl. 339-97.00R.
Grandfils, Claude: *See—*
Abeille, Jean; Coeuillet, Jacques; Coutenceau, Francois; and Grandfils, Claude, 4,220,004, Cl. 60-413.000.
Graves, Richard A.: *See—*
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Green, Bethel Q.: *See—*
Javora, Paul H.; and Green, Bethel Q., 4,220,585, Cl. 260-124.00R.

Green, Billy J.: *See*—
Hixson, Harry F., Jr.; Green, Billy J.; Cummins, Laurence M.; and Cole, John W., 4,220,598, Cl. 260-397.100.

Green, George E.; and Zahir, Abdul-Cader, to Ciba-Geigy Corporation. Epoxide-containing compositions and their polymerization. 4,220,513, Cl. 204-159.230.

Green, William A.; Goodrich, William M.; and Long, David R., to Owens-Corning Fiberglas Corporation. Packaged strand. 4,220,295, Cl. 242-170.000.

Grega nee Toth, Erzsebet: *See*—
Dombay, Zsolt; Grega nee Toth, Erzsebet; Havelka, Ferenc; and Kovasznay, Anna, 4,220,467, Cl. 71-93.000.

Gregory, Robert O.; and Fricke, Louis H., Jr., to Monsanto Company. RF Induction heating circuits for float zone refining of semiconductor rods. 4,220,626, Cl. 422-250.000.

Grepiotis, John A.; and Grepiotis, Joseph A. Cooler and level indicator for beer kegs. 4,220,048, Cl. 73-323.000.

Grepiotis, Joseph A.: *See*—
Grepiotis, John A.; and Grepiotis, Joseph A., 4,220,048, Cl. 73-323.000.

Grimes, T. Wayne. Time teaching clock. 4,219,943, Cl. 35-39.000.

Grimstead, David: *See*—
Crossland, John S.; Grimstead, David; and Guy, Simon P., 4,219,906, Cl. 17-46.000.

Gris, Marcel P., to Societe Anonyme Dite: Etablissements Catu S.A. Versatile pulley. 4,220,315, Cl. 254-236.000.

Groko Maskin AB: *See*—
Naslund, Gustav, 4,220,031, Cl. 72-379.000.

Grollier, Jean-Francois; and Monnais, Christian, to L'Oreal. Solid, frozen stabilized hair dye. 4,220,447, Cl. 8-406.000.

Gross, Thomas A. O., to Foxboro Company, The. Electrodeless conductivity measuring system. 4,220,920, Cl. 324-442.000.

Groves, Michael: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; and Groves, Michael, 4,220,916, Cl. 324-71.00R.

Gruenewald, Frederick P., to Gruenewald Manufacturing Company, Inc. Dispensing device. 4,220,258, Cl. 222-46.000.

Gruenewald Manufacturing Company, Inc.: *See*—
Gruenewald, Frederick P., 4,220,258, Cl. 222-46.000.

Gruhier, Henri: *See*—
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,220,634, Cl. 423-356.000.

Grumman Aerospace Corporation: *See*—
Markow, Edward G.; and Penn, John R., III, 4,220,685, Cl. 428-103.000.

GTE Products Corporation: *See*—
Benasutti, John E., 4,220,397, Cl. 350-96.210.
Stoldt, Clayton L., 4,220,303, Cl. 248-205.00R.

GTE Sylvania Incorporated: *See*—
Fahey, Robert J., 4,220,825, Cl. 179-18.0FA.
Fahey, Robert J., 4,220,872, Cl. 307-32.000.

Gualdi, Piero, to Spray Plast S.r.l. Hand sprayer for liquids. 4,220,285, Cl. 239-309.000.

Gudra, Tadeusz: *See*—
Ciszewski, Tadeusz; and Gudra, Tadeusz, 4,220,886, Cl. 310-325.000.

Gukov, Gennady P.: *See*—
Aladiev, Ivan T.; Voskresensky, Kirill D.; Gukov, Gennady P.; Saperov, Evgeny V.; and Fardzinov, Valery K., 4,220,202, Cl. 166-57.000.

Gulf Oil Corporation: *See*—
Kirkpatrick, Joel L., 4,220,790, Cl. 548-265.000.
Patel, Natu R., 4,220,466, Cl. 71-92.000.
Rowatt, Robert J., 4,220,580, Cl. 260-33.6PQ.

Gulf & Western Manufacturing Company: *See*—
Ritzenthaler, Donald R., 4,220,937, Cl. 335-186.000.

Gullino, Pietro M.: *See*—
Knazek, Richard A.; and Gullino, Pietro M., 4,220,725, Cl. 435-285.000.

Gurusiddaiah, Sarangamat; Ronald, Robert C.; Magnuson, James A.; and McFadden, Bruce A., to Washington State University Research Foundation, Inc. Antibiotics produced by *Cytospora sp.* W.F.P.L. 13A. 4,220,718, Cl. 435-124.000.

Guy, Simon P.: *See*—
Crossland, John S.; Grimstead, David; and Guy, Simon P., 4,219,906, Cl. 17-46.000.

Gyromat Corp.: *See*—
Wiggins, Richard F., 4,220,432, Cl. 414-287.000.

Haas, Robert H.: *See*—
Jackson, Hugh R., deceased; and Haas, Robert H., 4,220,120, Cl. 123-3.000.

Haberstock, Egon: *See*—
Koser, Rolf; Haberstock, Egon; Breidenbend, Anton; and Wonderschutz, Manfred, 4,220,028, Cl. 72-117.000.

Habu, Nobuo: *See*—
Tomita, Kazuo; and Habu, Nobuo, 4,220,126, Cl. 123-411.000.

Hach Chemical Company: *See*—
Hach, Clifford C., 4,220,921, Cl. 324-447.000.

Hach, Clifford C., to Hach Chemical Company. Conductivity probe for viscous liquids. 4,220,921, Cl. 324-447.000.

Hager, Horst, to Nixdorf Computer AG. Process and apparatus for transferring information between an information store and a data channel. 4,220,997, Cl. 364-900.000.

Hagihara, Tadashi. Filtering scraper. 4,220,540, Cl. 210-415.000.

Haguchi, Hiroshi: *See*—
Iwasaki, Shigeo; and Haguchi, Hiroshi, 4,220,226, Cl. 188-77.00R.

Haines, Paul G.: *See*—
Popoff, Ivan C.; Mailey, Everett A.; and Haines, Paul G., 4,220,589, Cl. 548-215.000.

Hair, Lester E. Moisture barrier for fruit drying trays and the like. 4,219,941, Cl. 34-93.000.

Hake, Kenneth A., to Kent Manufacturing Company, Inc. Harrow with tine stop therefor. 4,220,211, Cl. 172-618.000.

Halcourt, Kurt; Losacker, Paul; Martin, Manfred; Schenk, Norbert; and Schwerdtel, Wulf, to Bayer Aktiengesellschaft. Process for the preparation of anthraquinone. 4,220,597, Cl. 260-369.000.

Hale, Dean H. Medial stools. 4,220,307, Cl. 248-404.000.

Hallett, Clarence W.: *See*—
Hallett, Howard F.; and Hallett, Clarence W., 4,220,184, Cl. 144-2.00Z.

Hallett, Howard F.; and Hallett, Clarence W. Delimber. 4,220,184, Cl. 144-2.00Z.

Halliburton Company: *See*—
Sullaway, Bob L., 4,220,422, Cl. 405-225.000.

Ham Baker & Company Limited: *See*—
Aston, Raymond; and Aston, David T., 4,220,420, Cl. 405-104.000.

Hamano, Koichi; Morimoto, Takao; Watanabe, Junko; Ono, Kaoru; and Yagi, Norio, to Tokyo Electric Co., Ltd. Electronic cash register with removable memory packs for cashier identification. 4,220,991, Cl. 364-405.000.

Hamashima, Yoshio: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,220,766, Cl. 544-182.000.

Hametner, Albert L.; Merrell, Hollis B.; and Trethewy, Brian R., to Boeing Company, The. Fastener selection system. 4,220,275, Cl. 227-5.000.

Hamilton, David C.; and Fleming, Joseph W., to Ramsey Controls, Inc. Dual, three phase, inverter-driven motor. 4,220,881, Cl. 310-184.000.

Hamilton, Jack E. Method and apparatus for self orienting a drill string while drilling a well bore. 4,220,213, Cl. 175-45.000.

Hammond, Ronald W.; and Conley, J. Howard, to Wheelabrator-Frye Inc. Filter device with top access to filter bag. 4,220,459, Cl. 55-341.00R.

Hampton, Diane M.: *See*—
Hampton, Jarold L.; and Hampton, Diane M., 4,220,302, Cl. 248-102.000.

Hampton, Jarold L.; and Hampton, Diane M. Nursing bottle holder. 4,220,302, Cl. 248-102.000.

Hanger, Randolph T.: *See*—
United States of America, National Aeronautics and Space Administration; Bloch, Joseph T.; Hanger, Randolph T.; and Nichols, Frank W., 4,219,926, Cl. 29-832.000.

Hanley, William H.; and Schrader, Clarence O., to Burton Silverplating Company. Selective electroplating. 4,220,504, Cl. 204-15.000.

Hannon, James V., to Diversified Packaging, Incorporated. Method for skin packaging using platen forming of the film, and packages produced thereby. 4,219,987, Cl. 53-427.000.

Hansen, Quinten A. Overload release clutch. 4,220,230, Cl. 192-56.00R.

Hanstein, Friedrich: *See*—
Kruska, Lothar H.; Hanstein, Friedrich; and Owen, Haven T., 4,219,910, Cl. 24-263.0SB.

Hara, Hiroto: *See*—
Kikumoto, Ryoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,220,603, Cl. 260-570.700.

Hara, Shigeyoshi; and Yamada, Takeyoshi, to Teijin Limited. Heat-curable and solvent-soluble ester group-containing polymer compositions and process for their preparation. 4,220,563, Cl. 260-2.300.

Harada, Tatsuo: *See*—
Kita, Toshiaki; Moriyama, Shigeo; and Harada, Tatsuo, 4,219,933, Cl. 33-19.00A.

Haraszti, Ibolya; Lackner, Peter; and Minner, Willy, to Licentia Patent-Verwaltungs-G.m.b.H. Circuit arrangement for identifying television signals. 4,220,970, Cl. 358-147.000.

Hargreaves, Brian; and Duncan, Angus D., to Pilkington Brothers Limited. Apparatus for cutting or scoring sheet material. 4,220,066, Cl. 83-886.000.

Hari, Eugen: *See*—
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Hari, Eugen, 4,220,641, Cl. 424-177.000.

Hari, Stefan: *See*—
Cseh, Georg; Roueche, Armand; and Hari, Stefan, 4,220,586, Cl. 260-157.000.

Harmon, Darell B., Jr.; and Foss, Arnold W., to United States of America, Army. Finlet injector. 4,220,297, Cl. 244-3.210.

Harnish, James R., to Borg-Warner Corporation. Pressure compensated control for air conditioning system or heat pump. 4,220,013, Cl. 62-209.000.

Harold Freeman Jewelry Mfg. Co., Inc.: *See*—
Freeman, Harold, 4,220,017, Cl. 63-15.000.

Harris Corporation: *See*—
Pelchat, Guy M.; and Baird, Charles A., 4,220,923, Cl. 455-295.000.

Harris, Michael J.: *See*—
Gegenhuber, Peter, 4,220,267, Cl. 222-520.000.

Hart, Michael G., to Relocator AG. Building element. 4,219,982, Cl. 52-641.000.

Hartmann & Braun Aktiengesellschaft: *See*—
Staab, Joachim; Apel, Willy; and Wolf, Heinz, 4,220,415, Cl. 356-433.000.

Hartwell Corporation: *See*—
Poe, L. Richard, 4,220,364, Cl. 292-341.180.

Harzer, Peter, to Wandel & Goltermann. Circuit arrangement for the control of a digitally settable load. 4,220,849, Cl. 235-92.0DE.
Hasegawa, Yoshio: *See*—
Yajima, Seishi; Okamura, Kiyohito; and Hasegawa, Yoshio, 4,220,600, Cl. 556-434.000.
Hashimoto, Mitsuyoshi; Hosokawa, Kiyoshi; and Murai, Bunjirou, to Toshiba Silicone Co., Ltd. Room temperature curable polysiloxane composition. 4,220,748, Cl. 528-18.000.
Hashimoto, Shigeru; and Ono, Toru, to Lion Fat and Oil Co., Ltd., The. Shampoo composition comprising calcium or magnesium anionic surfactants and quaternary nitrogen-containing cellulose ethers. 4,220,548, Cl. 252-106.000.
Hashimoto, Yoshihiko: *See*—
Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,220,734, Cl. 525-85.000.
Hasselbring, Rae E. Double door mailbox. 4,220,278, Cl. 232-35.000.
Hatcher, Charles S., to Phillips Petroleum Company. Spun-like continuous multifilament yarn. 4,219,997, Cl. 57-245.000.
Hatcher, John C., to Cole Manufacturing Company. Tongue for connecting a draft implement to a towing vehicle. 4,220,350, Cl. 280-656.000.
Hattori, Tadashi: *See*—
Nishida, Minoru; Hattori, Tadashi; and Yamaguchi, Hiroaki, 4,220,125, Cl. 123-407.000.
Hauden, Daniel: *See*—
Gagnepain, Jean-Jacques; Hauden, Daniel; Pegeot, Claude; and Michel, Monique, 4,220,888, Cl. 310-361.000.
Hauk, Ernest D., to Service Equipment Design Co., Inc. Casing perforator. 4,220,201, Cl. 166-55.200.
Hauni-Werke Korber & Co. KG: *See*—
Blidung, Otto; and Tolasch, Gerhard, 4,220,236, Cl. 198-347.000.
Lorenzen, Heinz-Christen, 4,220,164, Cl. 131-84.00R.
Haupt, Robert C.: *See*—
Johansen, Roy W.; and Haupt, Robert C., 4,220,372, Cl. 301-1.000.
Hauri, Hermann, to Genossenschaft Vebo Solothurnische Eingliederungsstatte fur Behinderte, Oensingen, Aarmatt. Closure for vacuum bottles and the like. 4,220,251, Cl. 215-365.000.
Havelka, Ferenc: *See*—
Dombay, Zsolt; Grega nee Toth, Erzsebet; Havelka, Ferenc; and Kovasznay, Anna, 4,220,467, Cl. 71-93.000.
Hawes, William H. Connector for welded continuous beam structures. 4,220,419, Cl. 403-189.000.
Hawkinson, Warren S., to Deluxe Check Printers, Inc. Sheet feeding, registering and printing apparatus. 4,220,081, Cl. 101-93.110.
Hays Heating & Plumbing Company: *See*—
Jackson, Jimmy; and Roquemore, William D., 4,220,208, Cl. 169-17.000.
Hazard, Robert E.: *See*—
Wilson, Woodrow S.; and Hazard, Robert E., 4,220,248, Cl. 215-235.000.
Hazelwood, John E., Sr., John E. Spring separator. 4,220,257, Cl. 221-156.000.
Heasley, Raymond E.: *See*—
Anderson, Harry E.; and Heasley, Raymond E., 4,220,318, Cl. 266-49.000.
Hebert, Chris J.; Hollister, Ralph T.; and Sweat, C. Downing, Jr. Apparatus for cleaning large tank interiors. 4,220,170, Cl. 134-167.00R.
Hedman, Dean L. R. Weedless changeable plastic lure. 4,219,956, Cl. 43-42.100.
Heeren, Richard H., to Teletype Corporation. Method of manufacturing a device in a silicon wafer. 4,219,925, Cl. 29-578.000.
Heeren, Richard H., to Teletype Corporation. Shift register suitable for controlling the energization of a multiwinding motor. 4,221,001, Cl. 365-78.000.
Hees, Eckart: *See*—
Beckers, Karl D.; Hees, Eckart; and Bauer, Gerhard, 4,220,269, Cl. 222-600.000.
Heise, Hartmut: *See*—
Berthold, Rudiger; Mees, Bernhard; and Heise, Hartmut, 4,220,799, Cl. 560-126.000.
Schneider, Max; Schmitt, Lothar; and Heise, Hartmut, 4,220,601, Cl. 260-562.00R.
Heitmann, Jurgen; and Maly, Hans-Peter, to Robert Bosch GmbH. Modification of T.V. image performed using ram storing the image content. 4,220,965, Cl. 358-22.000.
Heitmann, Wayne R.: *See*—
Walters, Roland L.; and Heitmann, Wayne R., 4,220,801, Cl. 562-468.000.
Hekimian Laboratories, Inc.: *See*—
Hekimian, Norris C., 4,220,914, Cl. 324-57.0DE.
Hekimian, Norris C., to Hekimian Laboratories, Inc. AM-PM Conversion for measuring delay distortion. 4,220,914, Cl. 324-57.0DE.
Helene Curtis Industries, Inc.: *See*—
Newell, Gerald P., 4,220,166, Cl. 132-7.000.
Newell, Gerald P., 4,220,167, Cl. 132-7.000.
Newell, Gerald P., 4,220,168, Cl. 132-7.000.
Heller, Harold G. Photochromic compounds. 4,220,708, Cl. 430-336.000.
Henderson, Cyril; Hollowell, William; and Close, Albert R., to American Safety Equipment Corporation. Cam guide for passive shoulder harness. 4,220,355, Cl. 280-804.000.
Hendrickson, Alvin E., to Planalp, Eldon W. General purpose navigation aid device. 4,220,994, Cl. 364-450.000.
Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA): *See*—
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,220,593, Cl. 260-340.700.
Loffelholz, Frido; Wedl, Peter; and Worschech, Kurt, 4,220,570, Cl. 260-23.0XA.
Hennenberg, Anneliese, heir: *See*—
Glindmeyer, Friedrich; Limpens, Karl; and Hennenberg, Wilhelm F., deceased, 4,220,182, Cl. 139-384.00B.
Hennenberg, Wilhelm F., deceased: *See*—
Glindmeyer, Friedrich; Limpens, Karl; and Hennenberg, Wilhelm F., deceased, 4,220,182, Cl. 139-384.00B.
Hennessey, William M.; and Bratro, Frederick E., to Burroughs Corporation. Protective mechanism for electronic apparatus. 4,220,809, Cl. 174-52.00R.
Henning, John C., to Stearns & Foster Company, The. Apparatus for expanding the width of preformed fibrous webs. 4,219,911, Cl. 28-103.000.
Henrichs, Franz-Josef: *See*—
Hesse, Heinrich; Luckeville, Rolf; and Henrichs, Franz-Josef, 4,220,277, Cl. 228-173.00F.
Henriot, Christophe, to L'Electronique des Vehicules et des Reseaux (E.V.R.). Device for controlling the running of urban transport vehicles. 4,220,946, Cl. 340-23.000.
Henry, Albert R., Sr., to Darf Corporation. Row crop attachment for combines. 4,219,992, Cl. 56-119.000.
Henry, Joseph P.: *See*—
Marcinkowsky, Arthur E.; and Henry, Joseph P., 4,220,803, Cl. 562-538.000.
Hepler, Leslie M.: *See*—
Reicher, Harold J.; and Hepler, Leslie M., 4,220,300, Cl. 246-169.00A.
Herbert, Werner: *See*—
Pimiskern, Klaus; and Herbert, Werner, 4,220,379, Cl. 308-36.000.
Herberts Gesellschaft mit beschrankter Haftung: *See*—
Patzschke, Hans-Peter, 4,220,568, Cl. 260-22.00D.
Herbowy, Roger W. Hand-wrist exerciser. 4,220,327, Cl. 272-67.000.
Hermann, Edward C.: *See*—
Whitney, Joel G.; and Hermann, Edward C., 4,220,776, Cl. 546-83.000.
Hermecz, Istvan; Fulop, Ferenc; Meszaros, Zoltan; Bernath, Gabor; and Knoll, Jozsef, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 2,3-Polymethylene-4-oxo-4H-pyrido[1,2-a]pyrimidines. 4,220,771, Cl. 544-252.000.
Hersey, Harold E., to Ranco Incorporated. Pressure responsive control unit employing snap action diaphragm. 4,220,836, Cl. 200-83.00P.
Hess, William M.: *See*—
Vegvari, Paul C.; Hess, William M.; and Chirico, Vincent E., 4,220,042, Cl. 73-150.00R.
Hesse, Heinrich; Luckeville, Rolf; and Henrichs, Franz-Josef, to Mannesmann Aktiengesellschaft. Axle bodies. 4,220,277, Cl. 228-173.00F.
Hesse, Klaus, to Licentia Patent-Verwaltungs-G.m.b.H. Method for guiding the final phase of ballistic missiles. 4,220,296, Cl. 244-3.140.
Heugebaert, Frans C.: *See*—
Janssens, Wilhelmus; Heugebaert, Frans C.; and Kokelenberg, Hendrik E., 4,220,710, Cl. 430-353.000.
Hickerson, Norman E. Flower pot watering apparatus. 4,219,967, Cl. 47-72.000.
Hiden, Hans: *See*—
Tulacs, Laszlo; and Hiden, Hans, 4,220,744, Cl. 526-86.000.
Hill, Donald J., to Allis-Chalmers Corporation. Bearing mount for a corn harvester snapping roll. 4,219,990, Cl. 56-14.200.
Hill, Robert H.: *See*—
Wafer, John A.; Hill, Robert H.; and Stephenson, William I., Jr., 4,220,934, Cl. 335-16.000.
Himes, James F.: *See*—
Mikulicz, Michael Z.; and Himes, James F., 4,220,806, Cl. 585-716.000.
Himmele, Walter: *See*—
Karg, Jochen; Patsch, Manfred; and Himmele, Walter, 4,220,777, Cl. 546-98.000.
Hines, William E.; and Severson, Verne L., to Northern Telecom Systems Corporation. Composite video automatic gain control amplifier. 4,220,931, Cl. 330-284.000.
Hiramatsu, Mitsuo: *See*—
Sugibuchi, Shigeyoshi; Hiramatsu, Mitsuo; and Aizawa, Takeo, 4,220,705, Cl. 430-294.000.
Hirose, Takao: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.
Hitachi Chemical Company, Ltd.: *See*—
Fukutomi, Naoki; Tsuru, Yoshiyuki; Kawaguchi, Kunio; and Naoyuki, Susumu, 4,219,927, Cl. 29-850.000.
Hitachi, Ltd.: *See*—
Abe, Katsuo; Taguchi, Noriyuki; Sugishita, Nobuyuki; and Isogai, Tokio, 4,220,547, Cl. 252-63.500.
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, 4,220,891, Cl. 313-345.000.
Ikeguchi, Takashi; Nogita, Shunsuke; Otani, Kouji; and Nishimura, Shigeoki, 4,220,858, Cl. 250-343.000.
Kita, Toshiaki; Moriyama, Shigeo; and Harada, Tatsuo, 4,219,933, Cl. 33-19.00A.
Oguro, Tomokatsu, 4,220,841, Cl. 219-10.55B.

Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.

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Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,220,695, Cl. 429-172.000.
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Hitchcock, Charles J., to United States of America, Health, Education & Welfare. Method of producing delayed release of sodium fluoride. 4,220,552, Cl. 252-316.000.

Hixson, Harry F., Jr.; Green, Billy J.; Cummins, Laurence M.; and Cole, John W., to Abbott Laboratories. Method and reagents for measuring the level of conjugated bile acids. 4,220,598, Cl. 260-397.100.

Hobday, Harold W. One-hand operated, ratchet-actuated, quick-set C-clamp. 4,220,322, Cl. 269-6.000.

Hochberg, Arthur K., to Burroughs Corporation. Reactant gas flow structure for a low pressure chemical vapor deposition system. 4,220,116, Cl. 118-715.000.

Hodkinson, Harold, to Automotive Products Limited. Method for locating annular seals and article produced thereby. 4,220,374, Cl. 303-6.00C.

Hoechst Aktiengesellschaft: *See*—
Berthold, Rudiger; Mees, Bernhard; and Heise, Hartmut, 4,220,799, Cl. 560-126.000.
Dursch, Walter; and Linke, Fritz, 4,220,610, Cl. 260-928.000.
Erckel, Rudiger; Schmidt, Erwin; Eckes, Helmut; and Rosch, Guter, 4,220,760, Cl. 542-460.000.
Schneider, Max; Schmitt, Lothar; and Heise, Hartmut, 4,220,601, Cl. 260-562.00R.
Wiedemann, Wolfgang, 4,220,697, Cl. 430-59.000.
Wiezer, Hartmut; Korbanka, Helmut; and Mayer, Norbert, 4,220,773, Cl. 546-19.000.

Hoeksema, Herman. Composition of matter and process. 4,220,786, Cl. 548-218.000.

Hoesch Werke Aktiengesellschaft: *See*—
Bartzick, Gunter; and Buhne, Gerd, 4,219,914, Cl. 29-56.500.

Hoffman, Arthur K.: *See*—
Zweig, Arnold; and Hoffman, Arthur K., 4,220,640, Cl. 424-175.000.

Hoffman, Jacob M., Jr.: *See*—
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,220,654, Cl. 424-273.00R.

Hoffmann-La Roche Inc.: *See*—
Fujiwara, Mitsuhiko; Fujiwara, Akiko; and Miyamoto, Chikara, 4,220,716, Cl. 435-58.000.
Muller, Jean-Claude; and Ramuz, Henri, 4,220,772, Cl. 544-255.000.

Hofmann, Hans: *See*—
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Hari, Eugen, 4,220,641, Cl. 424-177.000.

Hofmann, Wilfried; Luder, Gunther; Oppermann, Ruth; and Moll, Adolf H., to AGFA-Gevaert A.G. Microfiche reader. 4,220,404, Cl. 353-27.00R.

Holan, George; and Walser, Reimund A., to Commonwealth Scientific and Industrial Research Organization. Insecticidal esters. 4,220,591, Cl. 260-340.50R.

Holce, Thomas J.; and Huckins, Charles M., to Kentrox Industries, Inc. Telephone line attenuator network and attenuator pad therefor. 4,220,834, Cl. 179-190.000.

Holder, Morris E. Process for producing artificial fire logs. 4,220,453, Cl. 44-10.00B.

Holland, Elaine A. Methods and compositions using oak leaf extract. 4,220,676, Cl. 427-165.000.

Hollister, Ralph T.: *See*—
Hebert, Chris J.; Hollister, Ralph T.; and Sweat, C. Downing, Jr., 4,220,170, Cl. 134-167.00R.

Hollowell, William: *See*—
Henderson, Cyril; Hollowell, William; and Close, Albert R., 4,220,355, Cl. 280-804.000.

Holmes, Horace D. Self-locking fastener. 4,220,187, Cl. 151-20.000.

Hombak Maschinenfabrik KG: *See*—
Sybertz, Hans, 4,220,186, Cl. 144-230.000.

Honeywell Inc.: *See*—
Geokezas, Meletios; Larson, Rodney M.; and Serreyn, David V., 4,220,972, Cl. 358-166.000.
Mueller, Dale A.; and Serber, Stephen L., 4,220,010, Cl. 62-126.000.
Quarton, William T., 4,220,905, Cl. 320-39.000.
Vizenor, Richard P., 4,220,400, Cl. 350-174.000.

Hooker, Stephan F.: *See*—
Blood, Thomas S.; and Hooker, Stephan F., 4,220,992, Cl. 364-410.000.

Hoover Company, The: *See*—
Dyer, Robert F., 4,219,900, Cl. 15-339.000.

Horbaly, Judd: *See*—
Walmer, Harry E.; and Horbaly, Judd, 4,219,960, Cl. 46-19.000.

Hori, Hideichi: *See*—
Ban, Hiroshi; Hori, Hideichi; Kudo, Ryoichi; and Yoshida, Akio, 4,220,233, Cl. 192-106.200.

Horiike, Hideki: *See*—
Miki, Tamotsu; Narisawa, Shizuo; Horiike, Hideki; and Ichikawa, Ichiro, 4,220,738, Cl. 525-242.000.

Horn, Matthias W.: *See*—
Ney, Robert P.; and Horn, Matthias W., 4,220,812, Cl. 174-117.00F.

Horowitz, Alexandre, to Varitrac AG. Bogie. 4,220,096, Cl. 105-163.00R.

Horton, Robert A.; Simmons, John H.; and Bauer, Timothy R., to Precision Metalsmiths, Inc. Method of making tooling. 4,220,190, Cl. 164-35.000.

Hoshimi, Susumu; and Nakagawa, Kenzo, to Sony Corporation. Brushless DC motor. 4,220,879, Cl. 310-68.00R.

Hosokawa, Kiyoshi: *See*—
Hashimoto, Mitsuyoshi; Hosokawa, Kiyoshi; and Murai, Bunjirou, 4,220,748, Cl. 528-18.000.

Howell, George D.; and Lange, Donald A., to Calgon Corporation. Process for sealing phosphatized metal components. 4,220,485, Cl. 148-6.15Z.

Howell, Mark I.; and Sole, Lloyd H., to Electrolocation Limited. Apparatus for and methods of electromagnetic surveying of elongated underground conductors. 4,220,913, Cl. 324-52.000.

Howell, Stephen L.; Dietrich, Ralph N.; Robinson, John W.; and Osburn, James P., to Kimball International, Inc. Method and apparatus for rhythmic note pattern generation in electronic organs. 4,220,068, Cl. 84-1.030.

Howells, George A.; Murray, James A.; and Woodman, Douglas E., to International Standard Electric Corporation. Digital duplex transmission system. 4,220,816, Cl. 370-24.000.

Huber, William J., to RTE Corporation. Spider assembly for a high voltage fuse. 4,220,940, Cl. 337-231.000.

Huckins, Charles M.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,220,834, Cl. 179-190.000.

Huff, Larry D.: *See*—
Torrington, Leslie A.; and Huff, Larry D., 4,220,340, Cl. 274-13.00R.

Huff, Terrence: *See*—
Wristers, Harry J.; Poirot, Eugene E.; and Huff, Terrence, 4,220,555, Cl. 252-429.00B.

Huffines, James D.: *See*—
Frenier, Wayne W.; Coffey, Michael D.; Huffines, James D.; and Smith, Donald C., 4,220,550, Cl. 252-180.000.

Huffner, Stanley F.; and Smith, Hugh M., to Sun Chemical Corporation. Phthalocyanine pigments for coloring plastics. 4,220,479, Cl. 106-288.00Q.

Hughes Aircraft Company: *See*—
Ichida, LeRoy F.; Sturla, Robert A.; and Sacks, Jacob M., 4,220,967, Cl. 358-105.000.

Hughes, Horatio, Jr.; and Schilling, Robert A., to Westvaco Corporation. Method for determining the relative quantity of shives in a stream of fibrous particles. 4,220,499, Cl. 162-49.000.

Hughes, James W.; Kudchadker, Mohan V.; and Dunn, Nancy G., to Texaco Inc. Oil recovery method utilizing a dialkyl phenol polyethoxy alkyl sulfonate as a solubilizing co-surfactant. 4,220,204, Cl. 166-274.000.

Huitson, John J., to BP Chemicals Limited. Preservative composition. 4,220,661, Cl. 424-317.000.

Hukuba, Hiroshi. Illumination device. 4,220,985, Cl. 362-203.000.

Hultholm, Stig-Erik: *See*—
Fugleberg, Sigmund P.; Hultholm, Stig-Erik; Nyman, Bror G.; and Rastas, Jussi K., 4,220,627, Cl. 423-42.000.

Humphreys, John C., to Paramount Textile Machinery Co. Hosiery. 4,220,104, Cl. 112-262.100.

Hunt, Thomas K., to Ford Motor Company. Internal geometry of alkali metal thermoelectric generator devices. 4,220,692, Cl. 429-104.000.

Huntington, Gordon T. Safety piano dolly. 4,220,347, Cl. 280-79.10A.

Hurkmans, Antoon M.: *See*—
Rhyins, Richard W.; and Hurkmans, Antoon M., 4,220,978, Cl. 358-293.000.

Huwil-Werke GmbH Mobelschloss-und Beschlagfabriken: *See*—
Willach, Horst, 4,220,022, Cl. 70-278.000.

Hylmo, Bertil: *See*—
Bengtsson, Bengt L.; Bosund, Sven I. W.; and Hylmo, Bertil, 4,220,672, Cl. 426-615.000.

Ichida, LeRoy F.; Sturla, Robert A.; and Sacks, Jacob M., to Hughes Aircraft Company. Scene tracker using multiple independent correlators. 4,220,967, Cl. 358-105.000.

Ichikawa, Ichiro: *See*—
Miki, Tamotsu; Narisawa, Shizuo; Horiike, Hideki; and Ichikawa, Ichiro, 4,220,738, Cl. 525-242.000.

Ichikawa, Singo; and Kato, Yoshiaki, to Citizen Watch Company, Limited. Electronic timepiece equipped with battery life display. 4,219,999, Cl. 368-66.000.

ICI Australia Limited: *See*—
Englin, Boris, 4,220,743, Cl. 526-62.000.

Ideal Industries, Inc.: *See*—
Scott, William J., 4,220,811, Cl. 174-87.000.

Idegraf: *See*—
Laleta-Ballini, Jean M., 4,220,086, Cl. 101-450.100.

Ife, Robert J.: *See*—
Brown, Thomas H.; and Ife, Robert J., 4,220,767, Cl. 544-182.000.

Iida, Teiji: *See*—
Sakai, Yukio; and Iida, Teiji, 4,219,968, Cl. 49-40.000.

Ikeguchi, Shigehiko, to Sanyo Electric Co. Ltd.; and Tokyo Sanyo Electric Co., Ltd. Preset tuner. 4,220,922, Cl. 455-182.000.

Ikeguchi, Takashi; Nogita, Shunsuke; Otani, Kouji; and Nishimura, Shigeoki, to Hitachi, Ltd. Apparatus for detecting change in water quality. 4,220,858, Cl. 250-343.000.

IM Electronics Limited: *See*—
Vigurs, John P. C., 4,220,859, Cl. 250-353.000.

Imai, Tamotsu, to UOP Inc. Preparation of tertiary heterocyclic amines. 4,220,764, Cl. 544-178.000.

Imamura, Juichi, to Director General of Agency of Industrial Science and Technology; Sanko Chemical Co. Ltd.; and Nippon Soda Co. Ltd. Process for the production of intermediate oxidation products of toluene having ether linkages. 4,220,605, Cl. 568-432.000.
Imazaki, Yoshio, to Kansai Paint Co., Ltd. Method of metallic finishing. 4,220,675, Cl. 427-27.000.
Imhauser, Gunter: *See*—
Brauner, Dieter; Imhauser, Gunter; Kaluza, Hans; and Muschelknautz, Edgar, 4,220,416, Cl. 366-337.000.
Imperial Chemical Industries Limited: *See*—
Backhouse, Alan J., 4,220,679, Cl. 427-401.000.
Barker, Peter J.; and Cheal, Gerald R., 4,220,683, Cl. 428-35.000.
Clifford, Michael L., 4,220,620, Cl. 264-560.000.
Inaguma, Yoshiharu: *See*—
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Macchetta, Emilio, 4,220,973, Cl. 358-193.100.
Inoue Gomu Kogyo Kabushiki Kaisha: *See*—
Narita, Kozi, 4,220,681, Cl. 428-31.000.
Inoue, Nobuyoshi, to Copal Company Limited. Focal plane shutter. 4,220,409, Cl. 354-247.000.
Inouye, Shigeharu: *See*—
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.
Institut Francais du Petrole: *See*—
Cholet, Jacques, 4,220,109, Cl. 114-245.000.
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,220,634, Cl. 423-356.000.
Institut Sverkhtverdykh Materialov Akademii Nauk Ukrainskoi SSR: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.
Institute of Gas Technology: *See*—
Blurton, Keith F.; and Sammells, Anthony F., 4,220,690, Cl. 429-15.000.
Intermountain Health Care: *See*—
Clark, Justin S.; and Farr, Frederick L., 4,220,162, Cl. 128-724.000.
International Business Machines Corporation: *See*—
Alt, Paul M.; and Sahni, Omesh, 4,221,002, Cl. 365-111.000.
Cazcarra, Victor G., 4,220,483, Cl. 148-1.500.
Chang, Hsu; and Nigam, Anil, 4,221,003, Cl. 364-900.000.
Deutsch, Alina; Kryder, Mark H.; and Nystrom, Walter, 4,221,000, Cl. 365-2.000.
McMahon, Maurice T., Jr., 4,220,917, Cl. 324-73.00R.
Sprott, Charles N.; and Yates, Leonard S., 4,220,417, Cl. 400-70.000.
International Rectifier Corporation: *See*—
Rumennik, Vladimir, 4,220,963, Cl. 357-55.000.
International Standard Electric Corporation: *See*—
Antell, George R., 4,220,396, Cl. 350-96.150.
Dalgoutte, David G., 4,220,398, Cl. 350-96.210.
Howells, George A.; Murray, James A.; and Woodman, Douglas E., 4,220,816, Cl. 370-24.000.
Ruzic, Hugo, 4,220,828, Cl. 179-100.00D.
Ruzic, Hugo, 4,220,829, Cl. 179-103.000.
International Telephone and Telegraph Corporation: *See*—
Liu, Yet-Zen; and Chiang, Shang-Yi, 4,220,960, Cl. 357-17.000.
Inuzuka, Yutaka: *See*—
Kondo, Takeo; and Inuzuka, Yutaka, 4,220,418, Cl. 403-76.000.
Iseki & Co., Ltd.: *See*—
Ohashi, Masao; and Sakamoto, Hirokatsu, 4,220,073, Cl. 91-438.000.
Ishida, Akio: *See*—
Kanamoto, Sakumi; Ogisawa, Hiroshi; and Ishida, Akio, 4,220,334, Cl. 272-67.000.
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, to Hitachi Maxell, Ltd. Leak-proof alkaline cell and its manufacture. 4,220,695, Cl. 429-172.000.
Ishida, Tsutomu; and Iwaoka, Takehiko, to Ricoh Co., Ltd. Method for producing a large number of copies by means of copying apparatus. 4,220,699, Cl. 430-126.000.
Ishige, Sadao: *See*—
Usui, Hideo; Ishige, Sadao; and Saeki, Keiso, 4,220,356, Cl. 282-27.500.
Ishizuki, Kotoshige: *See*—
Umeda, Haruhiko; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Endo, Naotaka, 4,220,352, Cl. 280-708.000.
Isogai, Tokio: *See*—
Abe, Katsuo; Taguchi, Noriyuki; Sugishita, Nobuyuki; and Isogai, Tokio, 4,220,547, Cl. 252-63.500.
Israels, Sylvan H.; and Kosonocky, Stephan, to United States of America, Army. Delay fuze for explosive charge. 4,220,091, Cl. 102-64.000.
Istituto Sieroterapico e Vaccinogeno Toscano Sclavo S.p.A.: *See*—
Meiattini, Franco; Giannini, Giuliano; and Tarli, Paolo, 4,220,714, Cl. 435-17.000.
Ito, Akira: *See*—
Tanaka, Takao; Asanuma, Tadashi; Shiomura, Tetsunosuke; and Ito, Akira, 4,220,745, Cl. 526-125.000.
Ito, Hideichi: *See*—
Aida, Ko; Uchida, Kinya; Kawada, Izumi; and Ito, Hideichi, 4,220,719, Cl. 435-133.000.
Itoh, Jiro: *See*—
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.
ITT Industries, Inc.: *See*—
Burgdorf, Jochen; and Luepertz, Hans-Henning, 4,220,375, Cl. 303-6.00C.
Iwako, Akinobu: *See*—
Nanai, Sadaaki; and Iwako, Akinobu, 4,220,101, Cl. 112-158.00E.
Iwaoka, Kazuo: *See*—
Toh, Tagao; and Iwaoka, Kazuo, 4,220,625, Cl. 422-180.000.
Iwaoka, Takehiko: *See*—
Ishida, Tsutomu; and Iwaoka, Takehiko, 4,220,699, Cl. 430-126.000.
Iwasaki, Shigeo; and Haguchi, Hiroshi, to Mitsuishi Fukai Tekkosho, Okayama. Brake device for a friction press. 4,220,226, Cl. 188-77.00R.
Iwata, Yutaka; Takahashi, Seiichi; and Kaminishi, Katsuzo, to Oki Electric Industry Co., Ltd. High frequency semiconductor devices. 4,220,874, Cl. 307-256.000.
Izawa, Nobuyuki: *See*—
Kimura, Michio; Izawa, Nobuyuki; and Sakuma, Nobuaki, 4,220,088, Cl. 102-28.00R.
Izumi Denki Corporation: *See*—
Fujita, Teizo, 4,220,808, Cl. 174-48.000.
J. & J. Marquardt: *See*—
Storz, Werner; Wolpert, Siegfried; and Futterknecht, Kuno, 4,220,835, Cl. 200-67.0DB.
Jacek, Edwin S.; and Jacek, Janet B. Hose coupling. 4,220,360, Cl. 285-317.000.
Jacek, Janet B.: *See*—
Jacek, Edwin S.; and Jacek, Janet B., 4,220,360, Cl. 285-317.000.
Jackson, Alan D., to Cessna Aircraft Company, The. Momentum balance spool. 4,220,178, Cl. 137-625.300.
Jackson, Ellin E., executrix: *See*—
Jackson, Hugh R., deceased; and Haas, Robert H., 4,220,120, Cl. 123-3.000.
Jackson, Hugh R., deceased (by Jackson, Ellin E., executrix); and Haas, Robert H., to Union Oil Company of California. Internal combustion engine system and operation. 4,220,120, Cl. 123-3.000.
Jackson, Jimmy; and Roquemore, William D., to Hays Heating & Plumbing Company. Dry pipe fire extinguishing sprinkler system. 4,220,208, Cl. 169-17.000.
Jacobs, Alfred G.; and Seiders, Richard L., to Safe-T-Gard, Inc. Flexible strap type mounting device. 4,220,301, Cl. 248-74.0PB.
Jacobs Engineering Group Inc.: *See*—
Raulerson, J. D., Jr., 4,220,523, Cl. 209-17.000.
Jacobs, Terrence D., Sr. Wind controlled self-steering mechanism. 4,220,107, Cl. 114-144.00C.
Jacobson, Wayne M., to Cyclonaire Corporation. Method and apparatus for assisting pneumatic conveyors utilizing vacuum. 4,220,425, Cl. 406-86.000.
Jagatich, Carl T.: *See*—
Carlson, Roland W.; and Jagatich, Carl T., 4,220,860, Cl. 250-361.00R.
Jagenberg Werke Aktiengesellschaft: *See*—
Mohn, Hans-Werner, 4,220,237, Cl. 198-377.000.
Jahnke, Frederick C.; MacLean, John P.; Williams, Dale; and Brown, John D., to Texaco Inc. Fluidized catalytic cracking reactor. 4,220,623, Cl. 422-144.000.
Jakinovich, William, Jr., to Procter & Gamble Company, The. Zinc containing condiments. 4,220,667, Cl. 426-96.000.
Jakowicki, Henry. Tile construction for a swimming pool. 4,219,894, Cl. 4-488.000.
James, William L.; and Staudenmaier, Hans J., to Fennell Corporation. Fluid bed furnace and cover assembly for use thereon. 4,220,445, Cl. 432-250.000.
Jannelli, Gilbert G. Trial lens eyeglass clip. 4,220,402, Cl. 351-22.000.
Jansen-Herfeld, Rottger. Device for the straightening of thin metallic parts especially sheets. 4,220,035, Cl. 72-413.000.
Janssens, Wilhelmus; Heugebaert, Frans C.; and Kokelenberg, Hendrik E., to AGFA-Gevaert N.V. Photosensitive recording materials. 4,220,710, Cl. 430-353.000.
Jantzen, Charles A.; and Jantzen, L. Arthur. Extensible display mounting assembly. 4,220,310, Cl. 248-544.000.
Jantzen, L. Arthur: *See*—
Jantzen, Charles A.; and Jantzen, L. Arthur, 4,220,310, Cl. 248-544.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Tanimoto, Tsutomu; Nagasawa, Mutsuo; and Kashiwakura, Junji, 4,220,564, Cl. 260-5.000.
Javora, Paul H.; and Green, Bethel Q., to Dresser Industries, Inc. Drilling fluid additives. 4,220,585, Cl. 260-124.00R.
Jeanmart, Claude: *See*—
Cotrel, Claude; Jeanmart, Claude; Messer, Mayer N.; and Crisan, Cornel, 4,220,646, Cl. 424-250.000.
Jenkins, Oliver J.; and Mundinger, William D., to Youngstown Steel Door Company, The. Railway car door crank actuating mechanism. 4,220,098, Cl. 105-378.000.
Jennings, James M.; and Pazar, Nicholas S. Bracket apparatus. 4,220,198, Cl. 165-67.000.
Jet Research Center, Inc.: *See*—
Christopher, Glenn B., 4,220,687, Cl. 428-546.000.
Jobson, Ronald B.: *See*—
Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., 4,220,775, Cl. 546-77.000.

Johansen, Roy W.; and Haupt, Robert C., to Allis-Chalmers Corporation. Dual wheel and axle assembly. 4,220,372, Cl. 301-1.000.
Johansing, P. G., Jr. Hydraulic fluid cooling system. 4,220,015, Cl. 62-331.000.
Johansson, Johan G. I., to Defibrator Aktiebolag. Conveyor device for feeding lignocellulosic material to a disc-type grinding apparatus. 4,220,290, Cl. 241-247.000.
Johansson, Stig: *See*—
Carlsson, Bo; and Johansson, Stig, 4,219,973, Cl. 51-90.000.
John Zink Company: *See*—
Reed, Robert D.; and Goodnight, Hershel E., 4,220,444, Cl. 431-348.000.
Johnson, Arthur T.: *See*—
Berlin, Howard M.; and Johnson, Arthur T., 4,220,161, Cl. 128-720.000.
Johnson, Clarine; and Spector, George. Picnic basket on rollers. 4,220,345, Cl. 280-43.160.
Johnson, James F., to Packard Instrument Company, Inc. Scintillation counter with rotatable light seal. 4,220,855, Cl. 250-328.000.
Johnson, Jay M., to Yellow Springs Instrument Co., Inc., The. Stabilization of activated galactose oxidase enzyme. 4,220,503, Cl. 204-1.00T.
Johnson, Keith, Jr., to AMP Incorporated. Assembly machine. 4,219,913, Cl. 29-33.00M.
Johnson, Lewis A.; and Wirostko, Emil. Method for treatment of human eye disease. 4,220,657, Cl. 424-285.000.
Johnson, Lyle J.; Mote, Jimmy D.; and Yoblin, Jack A., to Concast, Inc. Method for explosive forming of tubular molds for continuous steel casting. 4,220,027, Cl. 72-56.000.
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Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., 4,220,775, Cl. 546-77.000.
Johnston Laboratories, Inc.: *See*—
Ahnell, Joseph E., 4,220,715, Cl. 435-34.000.
Jones, David F.: *See*—
Burke, Edmund T.; and Jones, David F., 4,220,827, Cl. 179-99.0LS.
Jones, Richard H., to Du Pont de Nemours, E. I., and Company. Thermally stable, flame-retardant polymers. 4,220,733, Cl. 525-66.000.
Jungo, Moritz: *See*—
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.
Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*—
Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, 4,220,179, Cl. 138-113.000.
Kabushiki Kaisha Doi: *See*—
Kodaka, Fujio; and Oonuma, Hidemichi, 4,220,408, Cl. 354-187.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Mishima, Toshio, 4,220,067, Cl. 84-1.030.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Shoda, Hiroshi, 4,220,995, Cl. 364-508.000.
Tsukiji, Yoshihiro, 4,220,061, Cl. 82-36.00R.
Umeda, Haruhiko; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Endo, Naotaka, 4,220,352, Cl. 280-708.000.
Kabushiki Kaisha Naka Gijutsu Kenkyusho: *See*—
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.
Kabushiki Kaisha Yaskawa Denki Seisakusho: *See*—
Nanai, Sadaaki; and Iwako, Akinobu, 4,220,101, Cl. 112-158.00E.
Kadono, Mamoru: *See*—
Koga, Tomohiro; Saigusa, Tetsuji; and Kadono, Mamoru, 4,220,180, Cl. 138-120.000.
Kagawa, Keiji; Kanda, Naoya; Masuko, Fujio; and Nakanishi, Hirotoshi, to Sumitomo Chemical Company, Limited. Synthesis of substituted phenylacetic acid. 4,220,592, Cl. 260-340.50R.
Kahn, Leonard R. AM Stereo transmitter. 4,220,818, Cl. 179-1.0GS.
Kahn, Marvin L.; and Eapen, Kuttikandathil E., to Rich Products Corporation. Intermediate-moisture frozen foods. 4,220,671, Cl. 426-321.000.
Kakuhashi, Takeshi; and Miyake, Yasufumi, to Nitto Electric Industrial Co., Ltd. Printed circuit substrate with resistance coat. 4,220,945, Cl. 338-308.000.
Kakuta, Takao. Traveling toy. 4,219,957, Cl. 46-1.00C.
Kallweit, Gerhard: *See*—
Pudelko, Heinz; and Kallweit, Gerhard, 4,220,944, Cl. 338-176.000.
Kalopissis, Gregoire; and Vanlerberghe, Guy, to L'Oreal. Cationic surface-active agents. 4,220,602, Cl. 260-570.700.
Kaluza, Hans: *See*—
Brauner, Dieter; Imhauser, Gunter; Kaluza, Hans; and Muschelknautz, Edgar, 4,220,416, Cl. 366-337.000.
Kamaike, Hiroshi; and Uchino, Hideo, to Mitsubishi Denki Kabushiki Kaisha. Automatic landing apparatus in service interruption. 4,220,222, Cl. 187-29.00R.
Kaminishi, Katsuzo: *See*—
Iwata, Yutaka; Takahashi, Seiichi; and Kaminishi, Katsuzo, 4,220,874, Cl. 307-256.000.
Kampmann, Frank S., to Apt Corporation. Audio playback systems. 4,220,817, Cl. 179-1.00D.
Kamyr, Inc.: *See*—
Prough, James R., 4,220,498, Cl. 162-25.000.
Kanamoto, Sakumi; Ogisawa, Hiroshi; and Ishida, Akio, to Maruho Co., Ltd. Separable type elastic finger rehabilitation device. 4,220,334, Cl. 272-67.000.
Kanda, Naoya: *See*—
Kagawa, Keiji; Kanda, Naoya; Masuko, Fujio; and Nakanishi, Hirotoshi, 4,220,592, Cl. 260-340.50R.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,220,734, Cl. 525-85.000.
Kansai Paint Co., Ltd.: *See*—
Imazaki, Yoshio, 4,220,675, Cl. 427-27.000.
Kantorski, Joseph W., to American Optical Corporation. Apparatus for monitoring instrument readings of transient force of a moving fluid column. 4,220,038, Cl. 73-1.00B.
Kao Soap Co., Ltd.: *See*—
Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, 4,220,670, Cl. 426-287.000.
Kappel, Friedrich, to Wolf-Gerate GmbH. Lawn mower with vertically adjustable wheels. 4,220,344, Cl. 280-43.000.
Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,220,224, Cl. 188-73.300.
Karg, Jochen; Patsch, Manfred; and Himmele, Walter, to BASF Aktiengesellschaft. Naphthalimide derivatives. 4,220,777, Cl. 546-98.000.
Karkhanis, Yashwant D.; and Carlo, Dennis J., to Merck & Co., Inc. Antigenic complex from *N. Gonorrhoeae*. 4,220,638, Cl. 424-92.000.
Karkhanis, Yashwant D.: *See*—
Limjuco, Guadalupe A.; Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,220,584, Cl. 260-112.00R.
Karl Lenhardt, Firma: *See*—
Lenhardt, Karl, 4,220,492, Cl. 156-358.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Kohl, Karl, 4,220,020, Cl. 66-84.00A.
Mista, Kresimir, 4,220,362, Cl. 289-2.000.
Karyazin, Pavel P.: *See*—
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.
Kasahara, Takahiko; Shichi, Shigeharu; and Suito, Senji, to Aisin Seiki Kabushiki Kaisha. Auxiliary table for sewing machines of a free arm type. 4,220,103, Cl. 112-260.000.
Kashiwakura, Junji: *See*—
Tanimoto, Tsutomu; Nagasawa, Mutsuo; and Kashiwakura, Junji, 4,220,564, Cl. 260-5.000.
Kato, Masayuki: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, 4,220,647, Cl. 424-258.000.
Kato, Osamu: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.
Kato, Tetuo, to Tokico Ltd. Hydraulic damper. 4,220,228, Cl. 188-319.000.
Kato, Yoshiaki: *See*—
Ichikawa, Singo; and Kato, Yoshiaki, 4,219,999, Cl. 368-66.000.
Katoh, Kazunobu, to Fuji Photo Film Co., Ltd. Photographic receiving layer with acid processed gelatin. 4,220,703, Cl. 430-213.000.
Katz, David H., to Scripps Clinic & Research Foundation. Immunochemical conjugates: method and composition. 4,220,565, Cl. 260-6.000.
Kawabata, Minoru: *See*—
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.
Kawada, Izumi: *See*—
Aida, Ko; Uchida, Kinya; Kawada, Izumi; and Ito, Hideichi, 4,220,719, Cl. 435-133.000.
Kawaguchi, Kunio: *See*—
Fukutomi, Naoki; Tsuru, Yoshiyuki; Kawaguchi, Kunio; and Naoyuki, Susumu, 4,219,927, Cl. 29-850.000.
Kawai, Ituo; and Maeda, Hisaharu, to Terasaki Denki Sangyo Kabushiki Kaisha. Time division multiplex transmission system. 4,220,822, Cl. 370-83.000.
Kawaida, Sinji; and Kitayama, Yoshihumi, to Bridgestone Tire Company Limited. Tire building drum. 4,220,494, Cl. 156-415.000.
Kawamoto, Hirohisa; and Allen, Elmer L., Jr., to RCA Corporation. Resistivity measurement system. 4,220,915, Cl. 324-58.00A.
Kawamura, Takao: *See*—
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, 4,220,891, Cl. 313-345.000.
Kawasaki Steel Corporation: *See*—
Baba, Kazushi; Miura, Hisashi; and Tominaga, Yoshiharu, 4,220,025, Cl. 72-8.000.
Ebata, Sadao, 4,220,043, Cl. 73-159.000.
Kawase, Hidetoshi: *See*—
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.
Kays, Sandra E. Electronic liquid application rate monitoring system. 4,220,998, Cl. 364-510.000.
Keenan, Joyce A. Wall mountable astrology set. 4,219,944, Cl. 35-44.000.
Kel-Win Manufacturing Company, Inc.: *See*—
Keller, Robert J., III; Fox, Brian G.; and Korec, Benjamin A., 4,220,175, Cl. 137-454.600.
Keller, Harold A.: *See*—
Glover, Clinton G.; and Keller, Harold A., 4,220,130, Cl. 124-7.000.

Keller, Robert J., III; Fox, Brian G.; and Korec, Benjamin A., to Kel-Win Manufacturing Company, Inc. Anti-scald apparatus for a tub and shower single control faucet. 4,220,175, Cl. 137-454.600.

Kelley, Carl S., to Phillips Petroleum Company. Apparatus for regeneration of fluidized particles or catalysts. 4,220,622, Cl. 422-109.000.

Kelly, Donald A. Wind conversion lattice array, with multiple mini-turbo-generator modules. 4,220,870, Cl. 290-44.000.

Kelsey Hayes Co.: *See*—
Rinker, Kurt H.; and Evans, Anthony C., 4,220,223, Cl. 188-73.100.

Kenny, John, to Needle Industries Limited. Plug and socket connectors. 4,220,386, Cl. 339-60.00R.

Kent Manufacturing Company, Inc.: *See*—
Hake, Kenneth A., 4,220,211, Cl. 172-618.000.

Kentrox Industries, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,220,834, Cl. 179-190.000.

Kern, Horstmar; and Botzenhardt, Helmut, to Wieland-Werke Aktiengesellschaft. Heat-insulated structural section assembly. 4,219,983, Cl. 52-730.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; and Groves, Michael, 4,220,916, Cl. 324-71.00R.

Kersten, Ralf, to Siemens Aktiengesellschaft. Process for forming the connection between two groups of glass fibers. 4,220,619, Cl. 264-230.000.

Kesting, Robert E., to Nuclepore Corporation. Flexible microporous cellulosic membranes and methods of formation and use thereof. 4,220,477, Cl. 106-195.000.

KGM Associates: *See*—
Koppelman, Edward; Murray, Robert G.; Lapple, Charles E.; and Rao, A. Kishan, 4,220,458, Cl. 55-283.000.

Khlopkov, Leonid P.: *See*—
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Kho, Khe-Bing J.; and Stewart, Patrick H., to CL Industries Inc. Method, resin and catalyst for increasing the tensile strength and core hardness of a sand mold or core. 4,220,578, Cl. 260-31.80M.

Khukhareva, Natalya N.: *See*—
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.

Kidd, Patrick D.: *See*—
Orlowski, Jan A.; Kidd, Patrick D.; and Butler, David V., 4,220,582, Cl. 260-42.280.

Kiemer, Ralph F.; and Baugher, Robert C., to Steelastic Company, The. Guillotine assembly. 4,220,063, Cl. 83-635.000.

Kikkawa, Ikuo: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,220,766, Cl. 544-182.000.

Kikumoto, Ryoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, to Mitsubishi Chemical Industries, Limited. Pharmaceutically active (omega-aminoalkoxy)bibenzyls. 4,220,603, Cl. 260-570.700.

Kimball International, Inc.: *See*—
Howell, Stephen L.; Dietrich, Ralph N.; Robinson, John W.; and Osburn, James P., 4,220,068, Cl. 84-1.030.

Kimball, John P.; and Caceres, Cesar A., to Clinical Systems Associates, Inc. Method and apparatus for discrimination and detection of heart sounds. 4,220,160, Cl. 128-715.000.

Kimberling, Cleon V.; and Rupp, Gary P., to Colorado State University Research Foundation. Apparatus for spaying large animals. 4,220,155, Cl. 128-306.000.

Kimmelman, Walter D.: *See*—
Eisen, Harry; and Kimmelman, Walter D., 4,220,309, Cl. 248-542.000.

Kimura, Keiichi; and Negishi, Eimei, to Nippon Kogaku K.K. Apparatus for guiding continuous chip formed in lathing. 4,220,427, Cl. 407-3.000.

Kimura, Michio; Izawa, Nobuyuki; and Sakuma, Nobuaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Static-resistant electric initiator. 4,220,088, Cl. 102-28.00R.

Kincel, Roger S., to BASF Aktiengesellschaft. Bearing cartridge mounting method. 4,219,916, Cl. 29-149.50R.

Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, to Bayer Aktiengesellschaft. Stabilizing pigmented lacquers with zeolites. 4,220,567, Cl. 260-22.00A.

Kindt, Robert J. Power generator. 4,220,006, Cl. 60-527.000.

King, Francis X., Jr.: *See*—
Shanklin, Frank G.; and King, Francis X., Jr., 4,219,988, Cl. 53-550.000.

King, John R. Nasal dust filter. 4,220,150, Cl. 128-206.110.

Kioritz Corporation: *See*—
Nagashima, Akira; and Saito, Yasuo, 4,219,932, Cl. 30-381.000.

Kirkpatrick, Joel L., to Gulf Oil Corporation. 1-N,N-Dimethylcarbamyl-3-tert.butyl-5-methylthio-1,2,4-triazole. 4,220,790, Cl. 548-265.000.

Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, to Fujisawa Pharmaceutical Co., Ltd. 1,2,3,4-Tetrahydroisoquinolines and the preparation thereof. 4,220,647, Cl. 424-258.000.

Kiss, William B., to Mitel Corporation. Ringing generator. 4,220,826, Cl. 179-51.0AA.

Kita, Ryuji, to Nippon Zeon Co. Ltd. Paint composition. 4,220,737, Cl. 525-214.000.

Kita, Toshiaki; Moriyama, Shigeo; and Harada, Tatsuo, to Hitachi, Ltd. Diffraction grating ruling engine. 4,219,933, Cl. 33-19.00A.

Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, to Victor Company of Japan, Limited. Bias level setting circuit for tape recorders with staircase high frequency signal. 4,220,979, Cl. 360-66.000.

Kitayama, Yoshihumi: *See*—
Kawaida, Sinji; and Kitayama, Yoshihumi, 4,220,494, Cl. 156-415.000.

Kitchen, Michael B.: *See*—
Palomo, Manuel W.; and Kitchen, Michael B., 4,220,100, Cl. 108-51.100.

Kiuchi, Norihiro: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.

Klann, Horst. Compression spring cramp. 4,219,918, Cl. 29-227.000.

Klaren, Dick G., to Esmil, B.V. Method and equipment for heat exchange. 4,220,193, Cl. 165-1.000.

Klauke, Erich: *See*—
Ehrig, Volker; Bien, Hans-Samuel, deceased; Klauke, Erich; and Schutze, Detlef-Ingo, 4,220,779, Cl. 546-152.000.

Kleckner, Richard M.: *See*—
Evenson, James E.; Kleckner, Richard M.; and Ma, James W., 4,220,359, Cl. 285-249.000.

Klein, Erich, to Dragoco Gerberding & Co GmbH. Bacteriostatic composition and method. 4,220,665, Cl. 424-343.000.

Klett, Dittmar: *See*—
Utz, Eberhard; Fehrenbach, Siegfried; Klett, Dittmar; Bertsch, Richard; and Knapp, Heinrich, 4,220,123, Cl. 123-327.000.

Kloss, Helmut: *See*—
Prohaska, Helmut; Reiterer, Franz; Bretthauer, Klaus; and Kloss, Helmut, 4,220,484, Cl. 148-6.300.

Kloss, John; and Nadzan, Alex M., to Abbott Laboratories. Method of producing 3-O-demethylfortimicin B,4-N-alkylfortimicin B derivatives and related aminoglycoside antibiotics. 4,220,756, Cl. 536-17.00R.

Kluender, Harold C.; and Arndt, Henry C., to Miles Laboratories, Inc. Cyclobutyl substituted derivatives of prostaglandin analogs. 4,220,795, Cl. 560-118.000.

Klug, Hans: *See*—
Petersen, Harro; Fischer, Kurt; Klug, Hans; and Trimborn, Werner, 4,220,751, Cl. 528-232.000.

Kluger, Michael A., to Bendix Corporation, The. Drum brake automatic adjuster. 4,220,227, Cl. 188-196.0BA.

Knabl, Rudolf: *See*—
Dempf, Dominik; Knabl, Rudolf; Schmidhammer, Ludwig; and Mack, Wilhelm, 4,220,607, Cl. 260-652.50R.

Knapp, Carl L.: *See*—
Luca, Vincent A., Jr.; Knapp, Carl L.; and Schildkraut, Alan L., 4,220,385, Cl. 339-59.00M.

Knapp, Heinrich: *See*—
Utz, Eberhard; Fehrenbach, Siegfried; Klett, Dittmar; Bertsch, Richard; and Knapp, Heinrich, 4,220,123, Cl. 123-327.000.

Knazek, Richard A.; and Gullino, Pietro M., to United States of America, America. Capillary cell culture device. 4,220,725, Cl. 435-285.000.

Knoll, Jozsef: *See*—
Hermecz, Istvan; Fulop, Ferenc; Meszaros, Zoltan; Bernath, Gabor; and Knoll, Jozsef, 4,220,771, Cl. 544-252.000.

Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., to Monsanto Company. Asymmetric catalysis. 4,220,590, Cl. 260-326.14T.

Knowlton, Christopher M.: *See*—
Burgoon, Jack L.; and Knowlton, Christopher M., 4,219,901, Cl. 15-352.000.

Kobayakawa, Masaki; and Okada, Toshio, to Nippon Electric Kagoshima, Limited. Fluorescent display panel comprising a grid lead having an indent. 4,220,894, Cl. 313-496.000.

Kobayashi, Kinzo, to Tokico Ltd. Disc brake. 4,220,225, Cl. 188-73.600.

Kobayashi, Kuniaki. Transmission control device for tilt cab type vehicle. 4,220,217, Cl. 180-328.000.

Kobayashi, Masayoshi, to Diesel Kiki Co., Ltd. Distribution type fuel injection pump. 4,220,128, Cl. 123-366.000.

Koch, Klaus D.: *See*—
Zeppenfeld, Kurt; and Koch, Klaus D., 4,220,538, Cl. 210-375.000.

Koch, Rudolf, to Siemens Aktiengesellschaft. Read-out process for a CID sensor matrix. 4,220,976, Cl. 358-213.000.

Kochevar, Rudolph J. Extrudable weight capsule. 4,220,336, Cl. 273-80.800.

Kochi, Hiromu: *See*—
Kishimoto, Teiji; Kochi, Hiromu; and Kato, Masayuki, 4,220,647, Cl. 424-258.000.
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,220,761, Cl. 544-27.000.

Kodaka, Fujio; and Oonuma, Hidemichi, to Kabushiki Kaisha Doi. Shutter release mechanism. 4,220,408, Cl. 354-187.000.

Kodera, Yoshiaki; Watanabe, Kiyoyuki; and Kusu, Takayuki, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Agricultural covering film or sheet and method for thermal insulation from a blend of an olefin resin and an acetal resin. 4,220,736, Cl. 525-154.000.

Koelsch, Francois: *See*—
Duchemin, Jean-Pascal; Leguen, Daniel; Bonnet, Michel; Koelsch, Francois; and Beuchet, Gerard, 4,220,488, Cl. 148-175.000.

Koether, Herbert F., to Over-Lowe Company, Inc. Portable floodlighting equipment. 4,220,981, Cl. 362-61.000.
Koga, Tomohiro; Saigusa, Tetsuji; and Kadono, Mamoru, to Bridgestone Tire Company Limited. Flexible pipe joint. 4,220,180, Cl. 138-120.000.
Kohl, Karl, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitting machine with weft inserters. 4,220,020, Cl. 66-84.00A.
Kohler, Werner: *See*—
Sommer, Karlheinz; and Kohler, Werner, 4,220,962, Cl. 357-52.000.
Kohzai, Yoshinori; and Oyama, Shigeaki, to Fujitsu Fanuc Limited. Direct current motor. 4,220,882, Cl. 310-186.000.
Koike, Kisaburo: *See*—
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McGrew, Jay L., 4,220,544, Cl. 210-526.000.
Mark, Victor, to General Electric Company. Translucent, flame-retardant polycarbonate compositions. 4,220,583, Cl. 260-45.70S.
Markow, Edward G.; and Penn, John R., III, to Grumman Aerospace Corporation. Passive fire protection system. 4,220,685, Cl. 428-103.000.
Marlowe, William H.: *See—*
Ban, Thomas E.; Sheppard, John C.; and Marlowe, William H., 4,220,454, Cl. 48-202.000.
Marquez, Fidencio G. Window shade sealing system. 4,220,189, Cl. 160-23.00R.
Marshall, John T.: *See—*
Sholl, Howard A.; and Marshall, John T., 4,220,049, Cl. 73-636.000.
Martens, Edward J., III; and Neumiller, Phillip J., to S. C. Johnson & Son, Inc. Vapor-dispensing device. 4,220,281, Cl. 239-57.000.
Marti, Milford F. Wheel brake assembly. 4,219,923, Cl. 29-434.000.
Martin, Henry, to Ciba-Geigy Corporation. Phenylglyoxylonitrile-2-oxime-cyanomethyl ether as plant growth regulator. 4,220,464, Cl. 71-77.000.
Martin, Manfred: *See—*
Halcourt, Kurt; Losacker, Paul; Martin, Manfred; Schenk, Norbert; and Schwerdtel, Wulf, 4,220,597, Cl. 260-369.000.
Martin & Pagenstecher GmbH: *See—*
Beckers, Karl D.; Hees, Eckart; and Bauer, Gerhard, 4,220,269, Cl. 222-600.000.
Martin, Philippe: *See—*
Marhic, Gerard; and Martin, Philippe, 4,220,889, Cl. 313-38.000.
Martin, Virgil B.: *See—*
Mast, James W.; Martin, Virgil B.; and Villers, Roger L., 4,220,019, Cl. 64-28.00R.
Martin, William A.: *See—*
Shroyer, Richard A.; and Martin, William A., 4,220,412, Cl. 356-218.000.
Martino, Ronald J., to Bausch & Lomb Incorporated. High intensity illumination light table. 4,220,982, Cl. 362-97.000.
Maruho Co., Ltd.: *See—*
Kanamoto, Sakumi; Ogisawa, Hiroshi; and Ishida, Akio, 4,220,334, Cl. 272-67.000.
Maruoka, Hiroyuki: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Nagaishi, Hatsuo; and Matsubara, Yuji, 4,220,045, Cl. 73-861.050.
Masamoto, Junzo: *See—*
Matsuzaki, Kazuhiko; and Masamoto, Junzo, 4,220,740, Cl. 525-398.000.
Maschinenbau Oppenweiler GmbH: *See—*
Weller, Hans, 4,220,324, Cl. 271-151.000.
Maschinenfabrik Zuckermann Komm. Ges.: *See—*
Schmidt, Erich, 4,219,974, Cl. 51-101.00R.
Massachusetts Institute of Technology: *See—*
Brueck, Steven R. J.; and Osgood, Richard M., Jr., 4,220,510, Cl. 204-157.10R.
Mast, James W.; Martin, Virgil B.; and Villers, Roger L., to Gehl Company. Shear clutch assembly with reverse drive mechanism for clearing overloads. 4,220,019, Cl. 64-28.00R.
Masugi, Takashi: *See—*
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,220,761, Cl. 544-27.000.
Masuko, Fujio: *See—*
Kagawa, Keiji; Kanda, Naoya; Masuko, Fujio; and Nakanishi, Hirotoshi, 4,220,592, Cl. 260-340.50R.
Mather & Platt Limited: *See—*
Bray, Geddes A., 4,220,452, Cl. 23-232.00R.
Matsubara, Yuji: *See—*
Suzuki, Suzuo; Maruoka, Hiroyuki; Nagaishi, Hatsuo; and Matsubara, Yuji, 4,220,045, Cl. 73-861.050.
Matsudaira, Takayuki: *See—*
Tanaka, Makoto; and Matsudaira, Takayuki, 4,220,026, Cl. 72-15.000.
Matsumoto, Masao; and Manabe, Isao, to Otsuka Chemical Co., Ltd. Process for disoxidating gas or water. 4,220,528, Cl. 210-758.000.
Matsumoto, Yasuo: *See—*
Mizutani, Shigemitsu; Tsuruta, Masao; Matsumoto, Yasuo; and Ono, Kengo, 4,220,292, Cl. 242-71.800.
Matsushima, Seiichi: *See—*
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,220,695, Cl. 429-172.000.
Uetani, Yoshio; Taniguchi, Yasuyoshi; Yokoyama, Kenichi; and Matsushima, Seiichi, 4,220,694, Cl. 429-172.000.
Matsushima, Yasunobu; Oda, Nobuyuki; and Terada, Haruyoshi, to Nihon Parkerizing Co., Ltd. Conversion coating solution for treating metallic surfaces. 4,220,486, Cl. 148-6.15R.
Matsushita Electric Industrial Co., Ltd.: *See—*
Shinohara, Koichi, 4,220,117, Cl. 118-718.000.
Toh, Tagao; and Iwaoka, Kazuo, 4,220,625, Cl. 422-180.000.
Matsuzaki, Kazuhiko; and Masamoto, Junzo, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing stabilized polyoxymethylene. 4,220,740, Cl. 525-398.000.
Matteo, Gene T.; and Sensinger, Wilbur A., to Crouse-Hinds Company. Hinged ballast tray. 4,220,986, Cl. 362-362.000.
Mauboussin, Joel, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Fuel tank gauge. 4,220,047, Cl. 73-313.000.
Mauric, Claudine; and Wolf, Rainer, to Sandoz Ltd. Dioxaphosphorinane derivatives as flameproofing agents. 4,220,472, Cl. 106-18.180.
Mauroner, Curtis. Pocket window. 4,219,971, Cl. 49-425.000.
Maxwell Laboratories, Inc.: *See—*
Drummond, James E., 4,220,906, Cl. 322-2.00A.
Mayer, Norbert: *See—*
Wiezer, Hartmut; Korbanka, Helmut; and Mayer, Norbert, 4,220,773, Cl. 546-19.000.
Mazer, Jack S.: *See—*
Shade, Russell L., Jr.; Reed, William G.; and Mazer, Jack S., 4,220,194, Cl. 165-1.000.
McBrayer, Robert L., to BASF Wyandotte Corporation. Microcellular polyurethane foams. 4,220,732, Cl. 521-167.000.

McBride, Thomas R.; Wake, Robert H.; and McCarthy, Robert H., to Ohio Nuclear, Inc. Data channel multiplexing system for CT scanner with rotating source. 4,220,863, Cl. 250-445.00T.

McCalister, William J. Method of rapid grass growth. 4,219,966, Cl. 47-9.000.

McCarthy, Robert H.: *See—*
McBride, Thomas R.; Wake, Robert H.; and McCarthy, Robert H., 4,220,863, Cl. 250-445.00T.

McCarty, Leslie P.; and Larsen, Eric R., to Dow Chemical Company, The. Deuterated isoflurane as an anesthetic agent. 4,220,664, Cl. 424-342.000.

McClung, R. Wayne: *See—*
Levene, Leon; and McClung, R. Wayne, 4,220,118, Cl. 118-720.000.

McCoy, Bryan L.: *See—*
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan L., 4,219,962, Cl. 46-232.000.

McDonnell, Jerry F.: *See—*
Freebairn, Hugh T.; and McDonnell, Jerry F., 4,219,965, Cl. 47-2.000.

McDowell, Jerry T., to Ball Corporation. Orienting and sizing battery grids and articles formed thereby. 4,220,030, Cl. 72-326.000.

McDowell-Wellman Company: *See—*
Ban, Thomas E.; Sheppard, John C.; and Marlowe, William H., 4,220,454, Cl. 48-202.000.

McDuffie, William N.: *See—*
Bash, Leroy A.; Cherry, Raymond B.; Speck, Robert M.; and McDuffie, William N., 4,220,951, Cl. 340-649.000.

McEachern, Richard D., to Abbott Laboratories. Bimodal autofocusing apparatus. 4,220,850, Cl. 250-204.000.

McElhaney, Joseph G.: *See—*
Brossman, William C.; McElhaney, Joseph G.; and Rooney, James H., III, 4,220,115, Cl. 118-684.000.

McEntee, Harry R.; and Potochnik, Frank S., to General Electric Company. Process for the recovery of alkyl chlorides. 4,220,609, Cl. 260-657.000.

McFadden, Bruce A.: *See—*
Gurusiddaiah, Sarangamat; Ronald, Robert C.; Magnuson, James A.; and McFadden, Bruce A., 4,220,718, Cl. 435-124.000.

McGrew, Jay L., to Marine Construction & Design Co. Apparatus for coalescing. 4,220,544, Cl. 210-526.000.

McGuckin, Hugh G.; and Cohen, Hyman L., to Eastman Kodak Company. Continuous-tone dyed diazo imaging elements. 4,220,700, Cl. 430-143.000.

McGurk, Stanley E. Picture frame. 4,219,949, Cl. 40-156.000.

McMahon, Maurice T., Jr., to International Business Machines Corporation. Test circuitry for module interconnection network. 4,220,917, Cl. 324-73.00R.

McMullan, James P.; and Stevens, Albert. Water bed heater. 4,220,848, Cl. 219-528.000.

McMurray, John C., to Russell, Burdsall & Ward Corporation. Locking fastener. 4,220,188, Cl. 151-37.000.

McRitchie, Allan C.: *See—*
Spadini, Gianfranco L.; Tolliday, Ian D.; and McRitchie, Allan C., 4,220,562, Cl. 252-542.000.

Medical Components Corp.: *See—*
Kyle, James C., 4,220,813, Cl. 174-152.0GM.
Kyle, James C.; and Cook, Donald F., 4,220,814, Cl. 174-152.0GM.

Medishield Corporation Limited, The: *See—*
Delpy, David T.; and Parker, Dawood, 4,220,158, Cl. 128-632.000.

Mees, Bernhard: *See—*
Berthold, Rudiger; Mees, Bernhard; and Heise, Hartmut, 4,220,799, Cl. 560-126.000.

Meiattini, Franco; Giannini, Giuliano; and Tarli, Paolo, to Istituto Sieroterapico e Vaccinogeno Toscano Sclavo S.p.A. Composition for inhibiting adenylate-kinase and its use. 4,220,714, Cl. 435-17.000.

Meier, Hans-Ulrich: *See—*
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.

Meiji Seika Kaisha, Ltd.: *See—*
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.

Meins, Peter: *See—*
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,220,593, Cl. 260-340.700.

Meiser, Gerd; and Dillhofer, Heinz, to Thyssen Industrie AG. Positioning device for positioning a movable part of a machine tool relative to a fixed part. 4,220,430, Cl. 409-231.000.

Meister, Otto; and Tobin, Thomas J., to S & C Electric Company. Circuit interrupting device. 4,220,942, Cl. 337-277.000.

Melara, Francescantonio, to Emilsider Meccanica S.n.c. di Melara Francescantonio & Co. Self-orientable wheel mechanism for furniture. 4,219,904, Cl. 16-47.000.

Mendez, Guadalupe C. Bowling game. 4,220,332, Cl. 273-41.000.

Mengel, Manfred: *See—*
Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, 4,220,567, Cl. 260-22.00A.

Mercer, Ronald H. Bowling practice and/or exercising device. 4,220,333, Cl. 273-54.00B.

Merck & Co., Inc.: *See—*
Bolhofer, William A.; Cragoe, Edward J., Jr.; and Hoffman, Jacob M., Jr., 4,220,654, Cl. 424-273.00R.
Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,220,638, Cl. 424-92.000.
Limjuco, Guadalupe A.; Karkhanis, Yashwant D.; and Carlo, Dennis J., 4,220,584, Cl. 260-112.00R.
Love, George M.; and Sohar, Paul, 4,220,762, Cl. 544-21.000.
Petersen, Kenneth M.; and Soulier, John E., 4,220,313, Cl. 251-280.000.
Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., 4,220,775, Cl. 546-77.000.
Remy, David C., 4,220,651, Cl. 424-267.000.

Merrell, Hollis B.: *See—*
Hametner, Albert L.; Merrell, Hollis B.; and Trethewy, Brian R., 4,220,275, Cl. 227-5.000.

Merten, Gerhard, to Gewerkschaft Eisenhutte Westfalia. Method of mineral mining plough operation in two directions of varying depth cut. 4,220,371, Cl. 299-18.000.

Messer Griesheim GmbH: *See—*
Schumann, Gunter, 4,220,903, Cl. 318-577.000.

Messer Griesheim GmbH. Patentabteilung: *See—*
Gokcek, Cetin, 4,220,183, Cl. 141-1.000.

Messer, Mayer N.: *See—*
Cotrel, Claude; Jeanmart, Claude; Messer, Mayer N.; and Crisan, Cornel, 4,220,646, Cl. 424-250.000.

Meszaros, Zoltan: *See—*
Hermecz, Istvan; Fulop, Ferenc; Meszaros, Zoltan; Bernath, Gabor; and Knoll, Jozsef, 4,220,771, Cl. 544-252.000.

Metal Closures Group Limited: *See—*
Brownbill, Thomas D., 4,220,250, Cl. 215-270.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Serbent, Harry; Eichberger, Heinz; Lommert, Hermann; Lausch, Herbert; and Steinhofel, Horst, 4,220,631, Cl. 423-175.000.
Simo, Thomas; and Eisenlohr, Karl H., 4,220,522, Cl. 208-177.000.

Metcalf, Gerald S.; and Kovacik, Paul J., to PPG Industries, Inc. Method for forming an accurately assembled laminate utilizing a vacuum holding press. 4,220,491, Cl. 156-285.000.

Meyer, Robert: *See—*
Duchene, Jacques; and Meyer, Robert, 4,220,514, Cl. 204-192.00P.

Miachon, Jean-Paul, to Robatel, S.L.P.I. Installation for the centrifugal extraction of one liquid by another. 4,220,279, Cl. 233-3.000.

Michel, Monique: *See—*
Gagnepain, Jean-Jacques; Hauden, Daniel; Pegeot, Claude; and Michel, Monique, 4,220,888, Cl. 310-361.000.

Mickelson, Grant A., to Union Oil Company of California. Fluorine-promoted sulfactive metal hydrogenation catalysts. 4,220,557, Cl. 252-441.000.

Middleton, Foster H.: *See—*
LeBlanc, Lester R.; and Middleton, Foster H., 4,220,044, Cl. 73-170.00A.

Mietzsch, Fritz; Rudolph, Hans; Wolfers, Heinrich; and Alberts, Heinrich, to Bayer Aktiengesellschaft. Process for the polymerization of ethylene in the presence of diaryl glycol ethers. 4,220,742, Cl. 526-209.000.

Miki, Tamotsu; Narisawa, Shizuo; Horiike, Hideki; and Ichikawa, Ichiro, to Sumitomo Chemical Company, Limited. Process for producing block copolymer from conjugated diene and vinyl aromatic. 4,220,738, Cl. 525-242.000.

Mikulicz, Michael Z.; and Himes, James F., to UOP Inc. Plural stages of hydrofluoric acid alkylation utilizing separated acid phase as catalyst in the subsequent stage. 4,220,806, Cl. 585-716.000.

Milanes, Eddy J.: *See—*
Maclean, George; Milanes, Eddy J.; and Pexton, Harold W., 4,220,084, Cl. 101-235.000.

Miles Laboratories, Inc.: *See—*
Beall, Glenn L.; and Noonan, Robert P., 4,220,252, Cl. 220-307.000.
Kluender, Harold C.; and Arndt, Henry C., 4,220,795, Cl. 560-118.000.

Miller, Peter S.; and Schermerhorn, Jerry D., to Owens-Illinois, Inc. Composite can registration. 4,220,077, Cl. 93-80.000.

Miller, Philip C.; and Retsky, Michael W., to Zenith Radio Corporation. Electrically resistive arc suppressor shadowing getter flash. 4,220,893, Cl. 313-450.000.

Mims, Carl C., Jr. Arm sling. 4,220,149, Cl. 128-94.000.

Min, Manki. Finger-toe nail clipper having shifting receptacle. 4,219,929, Cl. 30-28.000.

Minegishi, Masatoshi: *See—*
Baba, Toshiyuki; Ebihara, Isao; and Minegishi, Masatoshi, 4,220,500, Cl. 162-127.000.

Minner, Willy: *See—*
Haraszti, Ibolya; Lackner, Peter; and Minner, Willy, 4,220,970, Cl. 358-147.000.

Minolta Camera Kabushiki Kaisha: *See—*
Tanaka, Susumu; and Konishi, Katsutoshi, 4,220,696, Cl. 430-59.000.

Mintz, Irwin H., to Sky-Top Sunroofs Ltd. Motor control system for a linearly reciprocating load device such as automotive vehicle closure including sun roof. 4,220,900, Cl. 318-266.000.

Miranker, Samuel, to Automatic Steam Products Corporation. Apparatus for pressing clothing. 4,219,948, Cl. 38-10.000.

Mishima, Toshio, to Kabushiki Kaisha Kawai Gakki Seisakusho. Automatic musical performance instrument. 4,220,067, Cl. 84-1.030.

Mista, Kresimir, to Karl Mayer Textilmaschinenfabrik GmbH. Knotting apparatus for spooling machines. 4,220,362, Cl. 289-2.000.

Mitchell, Archer S.: *See—*
Borgoyn, Milton J.; and Mitchell, Archer S., 4,220,195, Cl. 165-1.000.

Mitchell, Ralph; and Sleeter, Thomas D. Protecting wood from wood degrading organisms. 4,220,688, Cl. 428-541.000.

Mitel Corporation: *See—*
Kiss, William B., 4,220,826, Cl. 179-51.0AA.

Mitoff, Stephan P.: *See—*
Roth, Walter L.; and Mitoff, Stephan P., 4,220,691, Cl. 429-104.000.

Mitsubishi Chemical Industries, Limited: *See—*
Kikumoto, Ryoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,220,603, Cl. 260-570.700.
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,220,587, Cl. 260-239.100.
Uchida, Shinzi; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,220,729, Cl. 521-124.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Baba, Kazushi; Miura, Hisashi; and Tominaga, Yoshiharu, 4,220,025, Cl. 72-8.000.
Kamaike, Hiroshi; and Uchino, Hideo, 4,220,222, Cl. 187-29.00R.
Tajima, Shinobu; and Ohta, Kazutoshi, 4,219,995, Cl. 57-220.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Maekawa, Naozane; and Awano, Takeshi, 4,220,353, Cl. 280-801.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Asano, Masuyuki; and Omuro, Shojiro, 4,220,878, Cl. 310-13.000.
Nakajima, Yasufumi; and Nakatani, Hayami, 4,220,613, Cl. 261-152.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Baba, Toshiyuki; Ebihara, Isao; and Minegishi, Masatoshi, 4,220,500, Cl. 162-127.000.
Date, Sukeaki; and Ebato, Seigo, 4,220,471, Cl. 430-532.000.
Tsubai, Yasuo; and Suzuki, Shigeyoshi, 4,220,702, Cl. 430-204.000.

Mitsui, Akio: *See—*
Nakamura, Kotaro; and Mitsui, Akio, 4,220,711, Cl. 430-507.000.

Mitsui Toatsu Chemicals, Inc.: *See—*
Tanaka, Takao; Asanuma, Tadashi; Shiomura, Tetsunosuke; and Ito, Akira, 4,220,745, Cl. 526-125.000.

Mitsuishi Fukai Tekkosho, Okayama: *See—*
Iwasaki, Shigeo; and Haguchi, Hiroshi, 4,220,226, Cl. 188-77.00R.

Miura, Hisashi: *See—*
Baba, Kazushi; Miura, Hisashi; and Tominaga, Yoshiharu, 4,220,025, Cl. 72-8.000.

Miwa, Naoto: *See—*
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,220,517, Cl. 204-195.00S.

Miyake, Yasufumi: *See—*
Kakuhashi, Takeshi; and Miyake, Yasufumi, 4,220,945, Cl. 338-308.000.

Miyamoto, Chikara: *See—*
Fujiwara, Mitsuhiko; Fujiwara, Akiko; and Miyamoto, Chikara, 4,220,716, Cl. 435-58.000.

Miyamoto, Tomohiko: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.

Miyashiro, Takeshi: *See—*
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.

Miyazaki, Yorizo: *See—*
Uchida, Isamu; Watanabe, Kenkichi; and Miyazaki, Yorizo, 4,219,985, Cl. 53-212.000.

Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, to Aisin Seiki Kabushiki Kaisha. Speed ratio control system for stepless transmission of vehicles. 4,220,059, Cl. 74-865.000.

Mizutani, Shigemitsu; Tsuruta, Masao; Matsumoto, Yasuo; and Ono, Kengo, to Fuji Photo Film Co., Ltd. Photography film spool. 4,220,292, Cl. 242-71.800.

Mobil Oil Corporation: *See—*
Chang, Clarence D.; and Lang, William H., 4,220,783, Cl. 546-251.000.
Olson, Robert H., 4,220,684, Cl. 428-35.000.

Moen, Lenard E. Manufacture of H-divider containers. 4,220,076, Cl. 93-37.0SP.

Mohn, Hans-Werner, to Jagenberg Werke Aktiengesellschaft. Bottle carrier for a labeling machine. 4,220,237, Cl. 198-377.000.

Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, to Toyo Seikan Kaisha, Ltd.; and Kao Soap Co., Ltd. Method for chemically peeling fruits and vegetables. 4,220,670, Cl. 426-287.000.

Moll, Adolf H.: *See—*
Hofmann, Wilfried; Luder, Gunther; Oppermann, Ruth; and Moll, Adolf H., 4,220,404, Cl. 353-27.00R.

Moller, Hinrich: *See—*
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,220,593, Cl. 260-340.700.

Monnais, Christian: *See—*
Grollier, Jean-Francois; and Monnais, Christian, 4,220,447, Cl. 8-406.000.

Monsanto Company: *See—*
Gregory, Robert O.; and Fricke, Louis H., Jr., 4,220,626, Cl. 422-250.000.
Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., 4,220,590, Cl. 260-326.14T.
Leonard, Richard L., 4,220,535, Cl. 210-321.00R.

Monsheimer, Rolf: *See—*
Berg, Alexander; Eckmayer, Zdenek; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,724, Cl. 435-273.000.
Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,723, Cl. 435-265.000.

Montedison S.p.A.: *See—*
Gozzo, Franco; Boschi, Pier Marino; and Longoni, Angelo, 4,220,789, Cl. 548-263.000.
Scata, Umberto; Luciani, Luciano; and Barbe, Pier C., 4,220,554, Cl. 252-429.00B.

Montgomery Elevator Company: *See—*
Wiles, Bradford; and Seaholm, Reuel A., 4,219,979, Cl. 52-204.000.

Montgomery, Theophalus S. Arm wrestling referee device. 4,220,330, Cl. 273-1.00E.

Montigel, John: *See—*
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.

Montone, Liber J., to Western Electric Company, Inc. Determining boundaries of a transparent tube. 4,220,966, Cl. 358-101.000.

Moore, Robert E. Swimming pool ball game and a tilted backstop for use in the game. 4,220,337, Cl. 273-395.000.

Moore, Robert E., to Suntech, Inc. Cyclic hydrocarbon perfluorination process. 4,220,606, Cl. 260-648.00F.

Moore, Ronnie J.; and Burrows, Walter H., to Moore, Ronnie J. Method for removing reflective decal. 4,220,549, Cl. 252-171.000.

Morelock, Charles R.: *See—*
St. Pierre, Philippe D.; Morelock, Charles R.; and Birle, John D., 4,220,455, Cl. 51-295.000.

Morgan Adhesives Company: *See—*
Carlson, Russell L., 4,220,490, Cl. 156-257.000.

Morgan, Gregory S.: *See—*
Lindsey, James C.; and Morgan, Gregory S., 4,220,235, Cl. 194-10.000.

Morgan, Howard W., Jr., to Filter Specialists, Inc. Filter having an interior liquid displacement means. 4,220,542, Cl. 210-474.000.

Morgan, Wayne A.: *See—*
Schulman, Joseph H.; and Morgan, Wayne A., 4,220,156, Cl. 128-419.00R.

Morganson, Neal E.: *See—*
Smialek, Raymond J.; and Morganson, Neal E., 4,220,769, Cl. 544-192.000.

Mori, Yasuki: *See—*
Sato, Moriyuki; and Mori, Yasuki, 4,220,755, Cl. 536-17.00R.

Morimoto, Takao: *See—*
Hamano, Koichi; Morimoto, Takao; Watanabe, Junko; Ono, Kaoru; and Yagi, Norio, 4,220,991, Cl. 364-405.000.

Morishita, Hiroshi: *See—*
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.

Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, to Mitsubishi Chemical Industries, Limited. Amino acid derivatives of 6-(2-amino-2-arylacetamido)penicillanic acids. 4,220,587, Cl. 260-239.100.

Moriyama, Shigeo: *See—*
Kita, Toshiaki; Moriyama, Shigeo; and Harada, Tatsuo, 4,219,933, Cl. 33-19.00A.

Morreale, Charles, to Burroughs Corporation. Flat cable soldering apparatus. 4,220,845, Cl. 219-243.000.

Morris, Richard L.; and Wulff, William H., to Outboard Marine Corporation. Adjustable air vane governor. 4,220,124, Cl. 123-391.000.

Morse, Glenn B.: *See—*
Baer, Harold J.; and Morse, Glenn B., 4,220,533, Cl. 210-223.000.

Morton, Clifton G. Container. 4,220,254, Cl. 220-354.000.

Morva, Tibor: *See—*
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.

Moss Rosenberg Verft a.s.: *See—*
Tonnessen, Arne, 4,220,255, Cl. 220-445.000.

Mote, Jimmy D.: *See—*
Johnson, Lyle J.; Mote, Jimmy D.; and Yoblin, Jack A., 4,220,027, Cl. 72-56.000.

Motorola, Inc.: *See—*
Mallien, Thomas O., II, 4,220,820, Cl. 179-2.0EB.
Ray, Kenneth I., 4,220,876, Cl. 307-296.00R.

Motter, William G. Airfoil suit. 4,220,299, Cl. 244-143.000.

Mottu, Pierre, executor: *See—*
Winter, Max, deceased; and Mottu, Pierre, executor, 4,220,561, Cl. 252-522.00R.

Muacevic, Gojko: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 4,220,659, Cl. 424-309.000.

Muchel, Franz, to Carl Zeiss Stiftung. Hand-held ophthalmoscope. 4,220,401, Cl. 351-13.000.

Mueller, Dale A.; and Serber, Stephen L., to Honeywell Inc. Loss of refrigerant and/or high discharge temperature protection for heat pumps. 4,220,010, Cl. 62-126.000.

Muller, Helmut: *See—*
Schottle, Helmut A. M.; and Muller, Helmut, 4,220,085, Cl. 101-316.000.

Muller, Jean-Claude; and Ramuz, Henri, to Hoffmann-La Roche Inc. Process for the preparation of oxadiazolopyrimidine derivatives. 4,220,772, Cl. 544-255.000.

Mullett, Leslie F., to Mullett, Leslie Fred; and University of Adelaide, The. Automatic spraying secateur. 4,219,963, Cl. 47-1.00R.
Mullett, Leslie Fred: *See—*
Mullett, Leslie F., 4,219,963, Cl. 47-1.00R.
Mundinger, William D.: *See—*
Jenkins, Oliver J.; and Mundinger, William D., 4,220,098, Cl. 105-378.000.
Murai, Bunjirou: *See—*
Hashimoto, Mitsuyoshi; Hosokawa, Kiyoshi; and Murai, Bunjirou, 4,220,748, Cl. 528-18.000.
Murata Manufacturing Co., Ltd.: *See—*
Yamamoto, Takami; and Azuchi, Yukihiro, 4,220,980, Cl. 361-293.000.
Yamashita, Yoshimasa; and Nakamura, Takeshi, 4,220,885, Cl. 310-321.000.
Murray, James A.: *See—*
Howells, George A.; Murray, James A.; and Woodman, Douglas E., 4,220,816, Cl. 370-24.000.
Murray, Robert G.: *See—*
Koppelman, Edward; Murray, Robert G.; Lapple, Charles E.; and Rao, A. Kishan, 4,220,458, Cl. 55-283.000.
Murrell, Lawrence L.: *See—*
Oswald, Alexis A.; and Murrell, Lawrence L., 4,220,556, Cl. 252-430.000.
Muschelknautz, Edgar: *See—*
Brauner, Dieter; Imhauser, Gunter; Kaluza, Hans; and Muschelknautz, Edgar, 4,220,416, Cl. 366-337.000.
Musgrave, Daniel D. Magazine status indicating devices. 4,219,953, Cl. 42-1.00B.
Mutt, Viktor: *See—*
Said, Sami I.; and Mutt, Viktor, 4,220,642, Cl. 424-177.000.
Mylenko, Yakov M.: *See—*
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.
N L Industries, Inc.: *See—*
Striffler, Eugene, Jr.; and Kolakowski, Michael A., 4,220,628, Cl. 423-92.000.
Nadzan, Alex M.: *See—*
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Nagai, Minoru: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.
Nagai, Shuzo: *See—*
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Nagaishi, Hatsuo: *See—*
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Nagasawa, Mutsuo: *See—*
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Nagashima, Akira; and Saito, Yasuo, to Kioritz Corporation. Chain sawing machine. 4,219,932, Cl. 30-381.000.
Nagata, Wataru: *See—*
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,220,766, Cl. 544-182.000.
Nagel, Martin J., to Tenna Corporation. Two-way speaker with transformer-coupled split coil. 4,220,832, Cl. 179-115.5PS.
Nagoya University, President of: *See—*
Udaka, Shigezo; and Shoda, Makoto, 4,220,527, Cl. 210-12.000.
Naito, Motoharu: *See—*
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Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, to Kabushiki Kaisha Naka Gijutsu Kenkyusho. Top rail for use on railing construction. 4,220,316, Cl. 256-59.000.
Nakagawa, Kenzo: *See—*
Hoshimi, Susumu; and Nakagawa, Kenzo, 4,220,879, Cl. 310-68.00R.
Nakajima, Yasufumi; and Nakatani, Hayami, to Mitsubishi Jukogyo Kabushiki Kaisha. Liquid feeder. 4,220,613, Cl. 261-152.000.
Nakamura, Kotaro; and Mitsui, Akio, to Fuji Photo Film Co., Ltd.; and Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive element. 4,220,711, Cl. 430-507.000.
Nakamura, Kotaro: *See—*
Furutachi, Nobuo; Nakamura, Kotaro; Arai, Atsuaki; Yamada, Minoru; and Shiba, Keisuke, 4,220,470, Cl. 430-387.000.
Nakamura, Takeshi: *See—*
Yamashita, Yoshimasa; and Nakamura, Takeshi, 4,220,885, Cl. 310-321.000.
Nakanishi, Hirotoshi: *See—*
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Nakatani, Hayami: *See—*
Nakajima, Yasufumi; and Nakatani, Hayami, 4,220,613, Cl. 261-152.000.
Nakatsuka, Hisayoshi, to Ortofon Manufacturing A/S. Pickup. 4,220,341, Cl. 274-37.000.
Nanai, Sadaaki; and Iwako, Akinobu, to Kabushiki Kaisha Yaskawa Denki Seisakusho. Automatic pattern generation type sewing machine. 4,220,101, Cl. 112-158.00E.
Nanpei, Masaru: *See—*
Etoh, Kuniomi; and Nanpei, Masaru, 4,220,704, Cl. 430-281.000.
Naoyuki, Susumu: *See—*
Fukutomi, Naoki; Tsuru, Yoshiyuki; Kawaguchi, Kunio; and Naoyuki, Susumu, 4,219,927, Cl. 29-850.000.
Narisawa, Shizuo: *See—*
Miki, Tamotsu; Narisawa, Shizuo; Horiike, Hideki; and Ichikawa, Ichiro, 4,220,738, Cl. 525-242.000.
Narita, Kozi, to Inoue Gomu Kogyo Kabushiki Kaisha. Trim for automobiles. 4,220,681, Cl. 428-31.000.
Naslund, Gustav, to Groko Maskin AB. Method for bending sectionsheet, plate strip and like material. 4,220,031, Cl. 72-379.000.
National Semiconductor Corporation: *See—*
Lawton, Rodney J., 4,220,875, Cl. 307-264.000.
Naughton, Francis C.: *See—*
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,220,581, Cl. 260-402.500.
Naumann, Klaus: *See—*
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Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek ten behoeve van Nijverheid, Handel en Verkeer: *See—*
de Kreuk, Casper W., 4,220,515, Cl. 204-195.00H.
Needle Industries Limited: *See—*
Kenny, John, 4,220,386, Cl. 339-60.00R.
Neel, Emmanuel E. A.: *See—*
Anquetil, Jean-Pierre; Deflin, Michel; Clement, Jean-Claude; and Neel, Emmanuel E. A., 4,220,560, Cl. 252-468.000.
Negishi, Eimei: *See—*
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Neilsen, Roger P. Wheel mounted alarm mechanism. 4,220,112, Cl. 116-56.000.
Nelson, Charles J.: *See—*
Bohm, Georg G. A.; and Nelson, Charles J., 4,220,512, Cl. 204-159.120.
Nerlich, Ernst-Gunter, to Bochumer Eisenhutte Heintzmann GmbH & Co. Valve arrangement for a walking mine roof support. 4,220,424, Cl. 405-302.000.
Neubauer, Jerry L.: *See—*
Braden, Ralph S.; Benasutti, Louis D.; and Neubauer, Jerry L., 4,220,266, Cl. 222-477.000.
Neumiller, Phillip J.: *See—*
Martens, Edward J., III; and Neumiller, Phillip J., 4,220,281, Cl. 239-57.000.
New York University: *See—*
Lehneis, Hans R., 4,220,148, Cl. 128-80.00C.
Newbery Energy Corporation: *See—*
Schuff, Richard W., 4,220,478, Cl. 106-281.00R.
Newell, Gerald P., to Helene Curtis Industries, Inc. Method of restoring normal moisture level to hair with severe moisture deficiency. 4,220,166, Cl. 132-7.000.
Newell, Gerald P., to Helene Curtis Industries, Inc. Method of restoring normal moisture level to hair with slight to moderate moisture deficiency. 4,220,167, Cl. 132-7.000.
Newell, Gerald P., to Helene Curtis Industries, Inc. Method of moisturizing and maintaining normal moisture level in hair having a normal moisture content. 4,220,168, Cl. 132-7.000.
Ney, Robert P.; and Horn, Matthias W., to Lynenwerk GmbH & Co. Kommanditgesellschaft. Electric cable for communication purposes. 4,220,812, Cl. 174-117.00F.
Nichols, Frank W.: *See—*
United States of America, National Aeronautics and Space Administration; Bloch, Joseph T.; Hanger, Randolph T.; and Nichols, Frank W., 4,219,926, Cl. 29-832.000.
Nicol, Thomas, to Lucas Industries Limited. Automotive battery charging system. 4,220,908, Cl. 322-33.000.
Nicola Staffolani: *See—*
Staffolani, Nicola, 4,220,712, Cl. 433-173.000.
Nielsen, Arnold T.; and Bedford, Clifford D., to United States of America, Navy. Synthesis of gem-dinitroalkanes. 4,220,804, Cl. 568-584.000.
Nielsen, Jacob A., to Kosan Crisplant A/S. Conveyor systems. 4,220,094, Cl. 104-89.000.
Nigam, Anil: *See—*
Chang, Hsu; and Nigam, Anil, 4,221,003, Cl. 364-900.000.
Nihon Parkerizing Co., Ltd.: *See—*
Matsushima, Yasunobu; Oda, Nobuyuki; and Terada, Haruyoshi, 4,220,486, Cl. 148-6.15R.
Nikawitz, Edward J.: *See—*
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,220,577, Cl. 260-29.6MN.
Nikitin, Jury I.: *See—*
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.
Niks, Anton: *See—*
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and vander Sijpt, Gerardus F., 4,220,463, Cl. 71-27.000.
Nilsson, Ake, to Aktiebolaget Bofors. Electromagnetic proximity fuze. 4,220,093, Cl. 102-212.000.

Nilsson, Erling I., to Tetra Pak Developpement SA. Closing arrangement for packing containers. 4,220,249, Cl. 215-237.000.
Ninomiya, Kunihiro: *See*—
Kikumoto, Ryoji; Ninomiya, Kunihiro; Fukami, Harukazu; and Hara, Hiroto, 4,220,603, Cl. 260-570.700.
Nippon Electric Kagoshima, Limited: *See*—
Kobayakawa, Masaki; and Okada, Toshio, 4,220,894, Cl. 313-496.000.
Nippon Kogaku K.K.: *See*—
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Nippon Mining Co., Ltd.: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.
Nippon Oil Co., Ltd.: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.
Nippon Petroleum Refining Company, Limited: *See*—
Fujita, Kohei; Owan, Youichi; and Ozawa, Minoru, 4,220,519, Cl. 208-48.0AA.
Nippon Soda Co. Ltd.: *See*—
Imamura, Juichi, 4,220,605, Cl. 568-432.000.
Nippon Soken, Inc.: *See*—
Nishida, Minoru; Hattori, Tadashi; and Yamaguchi, Hiroaki, 4,220,125, Cl. 123-407.000.
Nippon Zeon Co. Ltd.: *See*—
Akiyama, Shinichi; and Yamamoto, Haruhisa, 4,220,802, Cl. 562-535.000.
Kita, Ryuji, 4,220,737, Cl. 525-214.000.
Nippondenso Co., Ltd.: *See*—
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,220,517, Cl. 204-195.00S.
Sano, Hiromi; and Suzuki, Masatoshi, 4,220,516, Cl. 204-195.00S.
Yasui, Toshio; Naito, Motoharu; and Asami, Ken, 4,220,871, Cl. 307-10.00R.
Nishida, Minoru; Hattori, Tadashi; and Yamaguchi, Hiroaki, to Nippon Soken, Inc. Ignition timing control system for internal combustion engines. 4,220,125, Cl. 123-407.000.
Nishimura, Shigeoki: *See*—
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Nissan Motor Company, Limited: *See*—
Aoyama, Syunichi, 4,220,122, Cl. 123-90.550.
Suzuki, Suzuo; Maruoka, Hiroyuki; Nagaishi, Hatsuo; and Matsubara, Yuji, 4,220,045, Cl. 73-861.050.
Takeuchi, Tohru, 4,220,868, Cl. 290-7.000.
Nitadori, Kazuhiko, to Oki Electric Industry Co., Ltd. Digital scan converter. 4,220,969, Cl. 358-140.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Kakuhashi, Takeshi; and Miyake, Yasufumi, 4,220,945, Cl. 338-308.000.
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, to Nippondenso Co., Ltd. Oxygen concentration sensing apparatus. 4,220,517, Cl. 204-195.00S.
Niwa, Tomizo: *See*—
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.
Nixdorf Computer AG: *See*—
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NL Industries, Inc.: *See*—
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Nobbs, John W., to Alloway Trust Limited. Games rackets. 4,220,335, Cl. 273-73.00R.
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Nogita, Shunsuke: *See*—
Ikeguchi, Takashi; Nogita, Shunsuke; Otani, Kouji; and Nishimura, Shigeoki, 4,220,858, Cl. 250-343.000.
Noguchi, Yasuo; Kokuzawa, Taro; Suzuki, Hideyuki; and Yokose, Toru, to Sumitomo Bakelite Company Limited. Method and system for transmission and receipt of measuring ultrasonic wave. 4,220,040, Cl. 73-24.000.
Noiles, Douglas G., to United States Surgical Corporation. Prosthetic knee joint. 4,219,893, Cl. 3-1.911.
Nojiri, Chuhei: *See*—
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.
Noonan, Robert P.: *See*—
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Norberg, Gustav S. I.; and Segerstrom, Kjell E. L., to C. J. Wennberg AB. Method and machine for continuously transporting starting sheets. 4,220,240, Cl. 198-408.000.
Nordmann, Heinz-Georg: *See*—
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Northern Telecom Systems Corporation: *See*—
Hines, William E.; and Severson, Verne L., 4,220,931, Cl. 330-284.000.
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Kesting, Robert E., 4,220,477, Cl. 106-195.000.
Numakura, Toshihiko: *See*—
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Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Power steering apparatus. 4,220,072, Cl. 91-375.00A.
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Robison, Herbert D., 4,220,531, Cl. 210-189.000.
Nuver, Eric L. H., to Esquire, Inc. Non-interfering, overlapping high frequency signalling for lamp dimmer circuit. 4,220,895, Cl. 315-195.000.
Nyman, Bror G.: *See*—
Fugleberg, Sigmund P.; Hultholm, Stig-Erik; Nyman, Bror G.; and Rastas, Jussi K., 4,220,627, Cl. 423-42.000.
Nyssen, James. Multi-layer pipe with single corrugation in inner wall. 4,220,181, Cl. 138-154.000.
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O'Brien, John W. Time delay fluid valve. 4,220,173, Cl. 137-239.000.
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Oda, Nobuyuki: *See*—
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Oesterlin, Rudolf: *See*—
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Ogawa, Yasuaki: *See*—
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.
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Kotani, Yasutoyo; Sawada, Kazuo; Nagai, Shuzo; Ogino, Takao; and Watabe, Seiji, 4,220,508, Cl. 204-129.650.
Ogisawa, Hiroshi: *See*—
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Oguro, Tomokatsu, to Hitachi, Ltd. Microwave generating device utilizing a magnetron. 4,220,841, Cl. 219-10.55B.
Ohashi, Masao; and Sakamoto, Hirokatsu, to Iseki & Co., Ltd. Control valve for working machines. 4,220,073, Cl. 91-438.000.
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, to Meiji Seika Kaisha, Ltd. Antibiotics SF-2050 and SF-2050B substances and production and use thereof. 4,220,639, Cl. 424-117.000.
Ohio Nuclear, Inc.: *See*—
Carlson, Roland W.; and Jagatich, Carl T., 4,220,860, Cl. 250-361.00R.
McBride, Thomas R.; Wake, Robert H.; and McCarthy, Robert H., 4,220,863, Cl. 250-445.00T.
Ohkubo, Shoichi: *See*—
Uchida, Shinzi; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,220,729, Cl. 521-124.000.
Ohmura, Kaoru; Sasaguri, Kiichiro; and Toyomoto, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Epoxy resin composition for image formation. 4,220,707, Cl. 430-325.000.
Ohta, Kazutoshi: *See*—
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Ohya, Junichi: *See*—
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Okada, Toshio: *See*—
Kobayakawa, Masaki; and Okada, Toshio, 4,220,894, Cl. 313-496.000.
Okamura, Kiyohito: *See*—
Yajima, Seishi; Okamura, Kiyohito; and Hasegawa, Yoshio, 4,220,600, Cl. 556-434.000.
Oki Electric Industry Co., Ltd.: *See*—
Iwata, Yutaka; Takahashi, Seiichi; and Kaminishi, Katsuzo, 4,220,874, Cl. 307-256.000.
Nitadori, Kazuhiko, 4,220,969, Cl. 358-140.000.
Okubo, Shigeo. Angular accelerometer stabilized pendulum. 4,219,940, Cl. 33-366.000.
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Olin Corporation: *See*—
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Wojtowicz, John A.; and Scardera, Michael, 4,220,768, Cl. 544-190.000.

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Olson, Robert H., to Mobil Oil Corporation. Coextruded laminar thermoplastic bags. 4,220,684, Cl. 428-35.000.

Omata, Kenzo: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,220,587, Cl. 260-239.100.

Omnium Chimique: *See—*
Kuehne, Martin E., 4,220,774, Cl. 546-51.000.

Omuro, Shojiro: *See—*
Asano, Masuyuki; and Omuro, Shojiro, 4,220,878, Cl. 310-13.000.

Ono, Kaoru: *See—*
Hamano, Koichi; Morimoto, Takao; Watanabe, Junko; Ono, Kaoru; and Yagi, Norio, 4,220,991, Cl. 364-405.000.

Ono, Kengo: *See—*
Mizutani, Shigemitsu; Tsuruta, Masao; Matsumoto, Yazuo; and Ono, Kengo, 4,220,292, Cl. 242-71.800.

Ono, Toru: *See—*
Hashimoto, Shigeru; and Ono, Toru, 4,220,548, Cl. 252-106.000.

Onoye, Hideo: *See—*
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,220,979, Cl. 360-66.000.

Oonuma, Hidemichi: *See—*
Kodaka, Fujio; and Oonuma, Hidemichi, 4,220,408, Cl. 354-187.000.

Oppermann, Ruth: *See—*
Hofmann, Wilfried; Luder, Gunther; Oppermann, Ruth; and Moll, Adolf H., 4,220,404, Cl. 353-27.00R.

Ore', Fernando N., to Occidental Petroleum Corporation. Hemihydrate type process for phosphoric acid manufacture using additive to improve filterability. 4,220,630, Cl. 423-167.000.

Oreck Corporation: *See—*
DeMaagd, Donald R., 4,219,902, Cl. 15-364.000.

Orlowski, Jan A.; Kidd, Patrick D.; and Butler, David V., to Lee Pharmaceuticals. Dental restorative compositions of improved X-ray opacity. 4,220,582, Cl. 260-42.280.

Ortofon Manufacturing A/S: *See—*
Nakatsuka, Hisayoshi, 4,220,341, Cl. 274-37.000.

Osann, Robert, Jr. Digital phase decoding technique for quadrature phased signals. 4,220,924, Cl. 328-119.000.

Osburn, James P.: *See—*
Howell, Stephen L.; Dietrich, Ralph N.; Robinson, John W.; and Osburn, James P., 4,220,068, Cl. 84-1.030.

Osgood, Richard M., Jr.: *See—*
Brueck, Steven R. J.; and Osgood, Richard M., Jr., 4,220,510, Cl. 204-157.10R.

Osterhaus, Joseph C., to Perry Industries, Inc. Capping apparatus. 4,219,986, Cl. 53-314.000.

Oswald, Alexis A.; and Murrell, Lawrence L., to Exxon Research & Engineering Co. Silylhydrocarbyl phosphine transition metal complexes. 4,220,556, Cl. 252-430.000.

Ota, Masato; and Koike, Kisaburo, to Seiko Seiki Kabushiki Kaisha. Control apparatus for a grinding machine. 4,219,972, Cl. 51-5.00D.

Otani, Kouji: *See—*
Ikeguchi, Takashi; Nogita, Shunsuke; Otani, Kouji; and Nishimura, Shigeoki, 4,220,858, Cl. 250-343.000.

Otsuka Chemical Co., Ltd.: *See—*
Matsumoto, Masao; and Manabe, Isao, 4,220,528, Cl. 210-758.000.

Otsuka, Shigeru: *See—*
Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, 4,220,670, Cl. 426-287.000.

Otto Durr (Great Britain) Limited: *See—*
Walker, Reginald J.; and Geen, David T., 4,220,078, Cl. 98-115.0SB.

Oude Alink, Bernardus A.; and Thompson, Neil E. S., to Petrolite Corporation. Substituted pyridines. 4,220,785, Cl. 546-349.000.

Ouki, Masami: *See—*
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,220,517, Cl. 204-195.00S.

Outboard Marine Corporation: *See—*
Morris, Richard L.; and Wulff, William H., 4,220,124, Cl. 123-391.000.

Outokumpu Oy: *See—*
Fugleberg, Sigmund P.; Hultholm, Stig-Erik; Nyman, Bror G.; and Rastas, Jussi K., 4,220,627, Cl. 423-42.000.

Over-Lowe Company, Inc.: *See—*
Koether, Herbert F., 4,220,981, Cl. 362-61.000.

Owan, Youichi: *See—*
Fujita, Kohei; Owan, Youichi; and Ozawa, Minoru, 4,220,519, Cl. 208-48.0AA.

Owen, Haven T.: *See—*
Kruska, Lothar H.; Hanstein, Friedrich; and Owen, Haven T., 4,219,910, Cl. 24-263.0SB.

Owens-Corning Fiberglas Corporation: *See—*
Green, William A.; Goodrich, William M.; and Long, David R., 4,220,295, Cl. 242-170.000.

Owens-Illinois, Inc.: *See—*
Miller, Peter S.; and Schermerhorn, Jerry D., 4,220,077, Cl. 93-80.000.
Uhlig, Albert R.; and Krall, Thomas J., 4,220,262, Cl. 222-153.000.

Owers, Raymond G.: *See—*
Stewart, James L.; and Owers, Raymond G., 4,219,981, Cl. 52-478.000.

Oy Nokia AB: *See—*
Sammatti, Pekka T., 4,220,532, Cl. 210-221.00R.

Oyama, Shigeaki: *See—*
Kohzai, Yoshinori; and Oyama, Shigeaki, 4,220,882, Cl. 310-186.000.

Oyama, Testuo: *See—*
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, 4,220,891, Cl. 313-345.000.

Ozawa, Minoru: *See—*
Fujita, Kohei; Owan, Youichi; and Ozawa, Minoru, 4,220,519, Cl. 208-48.0AA.

P. R. Mallory & Co. Inc.: *See—*
Di Palma, Ralph B.; and Loh, Anthony, Jr., 4,220,693, Cl. 429-133.000.

Paar, Adalbert: *See—*
Burger, Alfred; and Paar, Adalbert, 4,220,021, Cl. 70-276.000.

Pacesetter Systems, Inc.: *See—*
Schulman, Joseph H.; and Morgan, Wayne A., 4,220,156, Cl. 128-419.00R.

Packard Instrument Company, Inc.: *See—*
Johnson, James F., 4,220,855, Cl. 250-328.000.

Padoan, Dante. Stator core for electric motor with transformer coil or the like incorporated therein but magnetically isolated therefrom. 4,220,883, Cl. 310-216.000.

Paice, Derek A., to United States of America, Interior. High frequency lighting inverter with constant power ballast. 4,220,896, Cl. 315-205.000.

Palacino, Giovanni, to Rockwell-Rimoldi S.p.A. Device for cutting and positioning a chain of stitches on a sewing machine. 4,220,105, Cl. 112-287.000.

Paladino, Anthony, to Eddy Oxford Enterprises Limited. Plow or digging machine automatic blade adjusting and locking system. 4,219,947, Cl. 37-193.000.

Palmer, David A.: *See—*
Schott, Jeffrey H.; Palmer, David A.; and Schroeder, Hobe, 4,220,596, Cl. 260-346.700.

Palmer, Stephen L.: *See—*
Friesen, Larry D.; and Palmer, Stephen L., 4,220,050, Cl. 74-2.000.

Palomo, Manuel W.; and Kitchen, Michael B. Symmetrical pallets. 4,220,100, Cl. 108-51.100.

Paluschinski, Hans: *See—*
Reichlin, Anton; Richter, Harald; and Paluschinski, Hans, 4,220,999, Cl. 364-900.000.

Pantomedical Grifo S.A.S.: *See—*
Staffolani, Nicola, 4,220,712, Cl. 433-173.000.

Paolella, Nicholas A.: *See—*
Anderson, Paul L.; and Paolella, Nicholas A., 4,220,792, Cl. 548-378.000.

Papa, Robert B. Apparatus for winding tape on cores. 4,220,291, Cl. 242-56.900.

Pappas, Dennis G.; Baum, Matthew C.; Small, Samuel N.; Adams, Robert T.; and Freedman, Robert P., to Pappas, Dennis G. Electromagnetic power generator. 4,220,907, Cl. 322-3.000.

Papst-Motoren KG: *See—*
von der Heide, Johann, 4,220,899, Cl. 318-135.000.

Paramount Textile Machinery Co.: *See—*
Humphreys, John C., 4,220,104, Cl. 112-262.100.

Parker, Dawood: *See—*
Delpy, David T.; and Parker, Dawood, 4,220,158, Cl. 128-632.000.

Parker-Hannifin Corporation: *See—*
Krause, Walter O., 4,220,553, Cl. 252-428.000.

Partus, Fred P., to Western Electric Company, Inc. Vapor delivery system and method. 4,220,460, Cl. 65-3.00A.

Paschke, Edward E.: *See—*
Cerefice, Steven A.; and Paschke, Edward E., 4,220,753, Cl. 528-302.000.

Patel, Natu R., to Gulf Oil Corporation. 4,5-Dicyanoimidazoles and use as herbicides. 4,220,466, Cl. 71-92.000.

Patsch, Manfred: *See—*
Karg, Jochen; Patsch, Manfred; and Himmele, Walter, 4,220,777, Cl. 546-98.000.

Patzschke, Hans-Peter, to Herberts Gesellschaft mit beschrankter Haftung. Polyester containing carboxyl groups, a process for producing this polyester and aqueous coating compositions containing this polyester. 4,220,568, Cl. 260-22.00D.

Pauliukonis, Richard S. Cryosolenoid valve. 4,220,312, Cl. 251-30.000.

Pawlak, Kenneth E.: *See—*
Francis, Howard T.; Abele, Robert J.; and Pawlak, Kenneth E., 4,220,159, Cl. 128-639.000.

Paxson Machine Company: *See—*
Potter, Robert, 4,220,064, Cl. 83-665.000.

Pazar, Nicholas S.: *See—*
Jennings, James M.; and Pazar, Nicholas S., 4,220,198, Cl. 165-67.000.

Peacher, Stanley E.: *See—*
Pfeiffer, Ronald E.; and Peacher, Stanley E., 4,220,617, Cl. 264-206.000.

Pegeot, Claude: *See—*
Gagnepain, Jean-Jacques; Hauden, Daniel; Pegeot, Claude; and Michel, Monique, 4,220,888, Cl. 310-361.000.

Pelchat, Guy M.; and Baird, Charles A., to Harris Corporation. Adaptive interference reduction system for crosstalk cancellation in a dual polarization system. 4,220,923, Cl. 455-295.000.

Pellegata, Renato: *See—*
Gandolfi, Carmelo; Pellegata, Renato; Faustini, Franco; and Fumagalli, Angelo, 4,220,759, Cl. 542-426.000.

Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,219,903, Cl. 16-21.000.

Pence, Dallas T.; and Thomas, Thomas R., to United States of America, Energy. Reduction of nitrogen oxides with catalytic acid resistant aluminosilicate molecular sieves and ammonia. 4,220,632, Cl. 423-239.000.

Penn, John R., III: *See*—
Markow, Edward G.; and Penn, John R., III, 4,220,685, Cl. 428-103.000.

Penney, Richard J. Solar energy collector. 4,220,136, Cl. 126-424.000.

Pennwalt Corporation: *See*—
Popoff, Ivan C.; Mailey, Everett A.; and Haines, Paul G., 4,220,589, Cl. 548-215.000.

Pepper, Michael, to Plessey Handel und Investments AG. Radiation hardness testing for field effect devices. 4,220,918, Cl. 324-158.00T.

Perilstein, Fred M. Polyphase variable frequency inverter with output voltage control. 4,220,989, Cl. 363-96.000.

Perimov, Jury A.: *See*—
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.

Perkin-Elmer Corporation, The: *See*—
Targowski, Roger W.; and Fisher, Chester G., III, 4,220,413, Cl. 356-315.000.

Perrone, Rosario J., to Denka Chemical Corporation. Polychloroprene plasticized with corn oil. 4,220,574, Cl. 260-23.70H.

Perry Industries, Inc.: *See*—
Osterhaus, Joseph C., 4,219,986, Cl. 53-314.000.

Perry, Joseph F. Food straining. 4,220,534, Cl. 210-232.000.

Petersen, Harro; Fischer, Kurt; Klug, Hans; and Trimborn, Werner, to BASF Aktiengesellschaft. Preparation of soft and hard resins, and their use. 4,220,751, Cl. 528-232.000.

Petersen, Kenneth M.; and Soulier, John E., to Merck & Co., Inc. Valve operator. 4,220,313, Cl. 251-280.000.

Petrolite Corporation: *See*—
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,220,785, Cl. 546-349.000.

Petrovich, Vojislav. Beneficiation of metallic ores by froth flotation using polyhydroxy amine depressants. 4,220,525, Cl. 209-167.000.

Petzold, Werner P., to Borg-Warner Corporation. Electronic control system for automatic transmission. 4,220,058, Cl. 74-751.000.

Pexton, Harold W.: *See*—
Maclean, George; Milanes, Eddy J.; and Pexton, Harold W., 4,220,084, Cl. 101-235.000.

Pfeiffer, Ronald E.; and Roberts, Robert W., to American Cyanamid Company. Melt-spinning acrylonitrile polymer fiber using spinnerette of high orifice density. 4,220,616, Cl. 264-206.000.

Pfeiffer, Ronald E.; and Peacher, Stanley E., to American Cyanamid Company. Process for melt-spinning acrylonitrile polymer fiber. 4,220,617, Cl. 264-206.000.

Pfizer Inc.: *See*—
Belletire, John L., 4,220,650, Cl. 424-267.000.
Dresback, David S., 4,220,152, Cl. 128-260.000.
Dresback, David S., 4,220,153, Cl. 128-260.000.

Pfleiderer, Ernst: *See*—
Berg, Alexander; Eckmayer, Zdenek; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,724, Cl. 435-273.000.
Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,723, Cl. 435-265.000.

Phelps, Francis E., to Dresser Industries, Inc. Earth boring bit with eccentrically machined bearing pin. 4,220,377, Cl. 308-8.200.

Philip Morris, Inc.: *See*—
Sanders, Edward B.; Secor, Henry V.; and Seeman, Jeffrey I., 4,220,781, Cl. 546-193.000.

Phillips, Frederick W.; Priepke, Edward H.; and Wagstaff, Robert A., to Sperry Corporation. Forage conveying apparatus. 4,220,289, Cl. 241-60.000.

Phillips, Leland G.: *See*—
Reinitz, Willard O.; and Phillips, Leland G., 4,219,969, Cl. 49-141.000.

Phillips Petroleum Company: *See*—
Austin, Oliver K., 4,220,624, Cl. 422-150.000.
Hatcher, Charles S., 4,219,997, Cl. 57-245.000.
Kelley, Carl S., 4,220,622, Cl. 422-109.000.
Stapp, Paul R., 4,220,604, Cl. 568-401.000.
Stapp, Paul R., 4,220,800, Cl. 560-246.000.

Pierfelice, Gilbert E.: *See*—
Cummins, James M.; and Pierfelice, Gilbert E., 4,220,143, Cl. 128-33.000.

Pierson, Fred W., Jr.: *See*—
Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., 4,220,618, Cl. 264-219.000.

Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., to M & T Manufacturing Company. Method of making a mold with a core supporting bushing. 4,220,618, Cl. 264-219.000.

Pigerol, Charles: *See*—
Bazile, Yves; de Cointet de Fillain, Paul; and Pigerol, Charles, 4,220,793, Cl. 549-68.000.

Pilkington Brothers Limited: *See*—
Hargreaves, Brian; and Duncan, Angus D., 4,220,066, Cl. 83-886.000.

Pilwat, Gunter: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; and Groves, Michael, 4,220,916, Cl. 324-71.00R.

Pimiskern, Klaus; and Herbert, Werner, to Dornier System GmbH. Spiral grooved spherical bearing. 4,220,379, Cl. 308-36.000.

Pirsh, Edward A., to Babcock & Wilcox Company, The. Filter house and method for simultaneously removing NO_x and particulate matter from a gas stream. 4,220,633, Cl. 423-239.000.

Piteo, Michael J., to R. E. Phelon Company. Half-wave regulator rectifier for an alternator. 4,220,909, Cl. 322-94.000.

Pitney Bowes Inc.: *See*—
Schottle, Helmut A. M.; and Muller, Helmut, 4,220,085, Cl. 101-316.000.

Place, Eugene W.; and Williams, David M., to Eagle Research and Development, Inc. Apparatus for in field unitizing of containers. 4,220,431, Cl. 414-35.000.

Planalp, Eldon W.: *See*—
Hendrickson, Alvin E., 4,220,994, Cl. 364-450.000.

Platt Saco Lowell Limited: *See*—
Farnhill, William M., 4,219,998, Cl. 57-293.000.

Plessey Handel und Investments AG.: *See*—
Buckner, Ian W., 4,220,926, Cl. 328-165.000.
Pepper, Michael, 4,220,918, Cl. 324-158.00T.

Ply, Lemuel L. Tubular pneumatic conveyor pipeline. 4,220,426, Cl. 406-89.000.

Poblete, Raul, to Codelco-Chile. Collector agent for the recovery of metal values in sulphide ores by froth flotation. 4,220,524, Cl. 209-166.000.

Poe, L. Richard, to Hartwell Corporation. Flush type latches. 4,220,364, Cl. 292-341.180.

Pogonowski, Ivo C., to Texaco Inc. Double action, self-contained swage. 4,220,034, Cl. 72-399.000.

Poirot, Eugene E.: *See*—
Wristers, Harry J.; Poirot, Eugene E.; and Huff, Terrence, 4,220,555, Cl. 252-429.00B.

Polinski, Leon M., to Engelhard Minerals & Chemicals Corporation. High temperature-stable catalyst composition. 4,220,559, Cl. 252-455.00R.

Politechnika Wroclawska: *See*—
Ciszewski, Tadeusz; and Gudra, Tadeusz, 4,220,886, Cl. 310-325.000.

Pollard, Ivor R. Supports for shelving or the like. 4,220,305, Cl. 248-245.000.

Poltoratsky, Vladimir G.: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.

Polytop Corporation: *See*—
Wilson, Woodrow S.; and Hazard, Robert E., 4,220,248, Cl. 215-235.000.

Pomagalski, S.A.: *See*—
Segafredo, Andre J., 4,220,095, Cl. 104-179.000.

Pope, George F.; and Childress, Evelyn O., to Diversified Manufacturing & Marketing Co., Inc. Electric fence monitor and alarm apparatus and method. 4,220,949, Cl. 340-533.000.

Popeck, Charles A.: *See*—
Mahieu, William R.; and Popeck, Charles A., 4,220,941, Cl. 337-250.000.

Popoff, Ivan C.; Mailey, Everett A.; and Haines, Paul G., to Pennwalt Corporation. N-(Oxazolidinothio) imides that provide scorch retardant nonblooming elastomeric compositions. 4,220,589, Cl. 548-215.000.

Posson, Philip L., to Explosive Technology, Inc. Linear ignition fuse. 4,220,087, Cl. 102-27.00R.

Potochnik, Frank S.: *See*—
McEntee, Harry R.; and Potochnik, Frank S., 4,220,609, Cl. 260-657.000.

Potter, Bronson M. Alien liquid detector and control. 4,220,041, Cl. 73-61.10R.

Potter, Robert, to Paxson Machine Company. Clamping device. 4,220,064, Cl. 83-665.000.

Powderley, John, to USM Corporation. Blind riveting tool. 4,220,033, Cl. 72-391.000.

Powell, David B., to General Electric Company. Manually operated generator circuit breaker. 4,220,936, Cl. 335-166.000.

Powers, Grady M.: *See*—
Braginetz, Paul A.; Powers, Grady M.; and Stowers, Kimball E., 4,219,935, Cl. 33-174.00R.

Powers, Thomas R.; and Clark, Ricky L., to TRW Inc. Indexable insert drill. 4,220,429, Cl. 408-224.000.

PPG Industries, Inc.: *See*—
Carley, Earl P.; and Ackley, Richard H., 4,220,496, Cl. 156-174.000.
Carley, Earl P., 4,220,497, Cl. 156-174.000.
Metcalf, Gerald S.; and Kovacik, Paul J., 4,220,491, Cl. 156-285.000.
Wallace, David R., 4,220,575, Cl. 260-29.300.

Prain, Hunter D.: *See*—
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,220,652, Cl. 424-270.000.

Precision Metalsmiths, Inc.: *See*—
Horton, Robert A.; Simmons, John H.; and Bauer, Timothy R., 4,220,190, Cl. 164-35.000.

Presby, Harry A. Floating brush floor cleaner. 4,219,898, Cl. 15-49.00R.

Preziosi, Anthony F.; Yee, Kwok C.; and Baughman, Ray H., to Allied Chemical Corporation. Crystalline diacetylene polymers. 4,220,747, Cl. 526-285.000.

Prichard, Guy, Jr., to Combustion Engineering, Inc. Transfer and inverter machine. 4,220,239, Cl. 198-403.000.

Priepke, Edward H.: *See*—
Phillips, Frederick W.; Priepke, Edward H.; and Wagstaff, Robert A., 4,220,289, Cl. 241-60.000.

Prikhna, Alexei I.: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.

Procter & Gamble Company, The: *See*—
Jakinovich, William, Jr., 4,220,667, Cl. 426-96.000.
Spadini, Gianfranco L.; Tolliday, Ian D.; and McRitchie, Allan C., 4,220,562, Cl. 252-542.000.
Strobel, Rudolf G. K., 4,220,673, Cl. 426-655.000.

Prodan, Kathleen: *See*—
Ellefson, Charles R.; and Prodan, Kathleen, 4,220,778, Cl. 546-150.000.

Produits Chimiques Ugine Kuhlmann: *See*—
Daude-Lagrave, Marie-Christine, 4,220,529, Cl. 210-758.000.

Produits Findus S.A.: *See*—
Bengtsson, Bengt L.; Bosund, Sven I. W.; and Hylmo, Bertil, 4,220,672, Cl. 426-615.000.

Prohaska, Helmut; Reiterer, Franz; Bretthauer, Klaus; and Kloss, Helmut, to Folienwalzwerk Brueder Teich Aktiengesellschaft. Process for the preparation of an aluminum base for offset printing plates and product. 4,220,484, Cl. 148-6.300.

Prough, James R., to Kamyr, Inc. Oxygen reactor systems pulp reject treatment. 4,220,498, Cl. 162-25.000.

Pudelko, Heinz; and Kallweit, Gerhard, to VDO Adolf Schindling AG. Resistance transducer with a non-linear characteristic curve. 4,220,944, Cl. 338-176.000.

Puppe, Lothar: *See*—
Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, 4,220,567, Cl. 260-22.00A.

Puskas, Imre; and Fields, Ellis K., to Standard Oil Company (Indiana). 4-Peroxyester derivatives of trimellitic anhydride. 4,220,746, Cl. 526-265.000.

Quarton, William T., to Honeywell Inc. Battery charger. 4,220,905, Cl. 320-39.000.

Quartz et Electronique: *See*—
Gagnepain, Jean-Jacques; Hauden, Daniel; Pegeot, Claude; and Michel, Monique, 4,220,888, Cl. 310-361.000.

R. E. Phelon Company: *See*—
Piteo, Michael J., 4,220,909, Cl. 322-94.000.

Radiation Dynamics, Inc.: *See*—
Derbyshire, Rodney L., 4,220,511, Cl. 204-159.200.

Radloff, Frederick J.: *See*—
Krolak, Ronald F.; and Radloff, Frederick J., 4,220,391, Cl. 339-126.00R.

Radowicz, Richard D. Applicator head for adhesive application system. 4,220,114, Cl. 118-411.000.

Railcar Maintenance Company: *See*—
DeWitt, Nick R., 4,220,437, Cl. 414-549.000.

Ramsden, James B. Solar panel shielding. 4,220,139, Cl. 126-441.000.

Ramsey Controls, Inc.: *See*—
Hamilton, David C.; and Fleming, Joseph W., 4,220,881, Cl. 310-184.000.

Ramuz, Henri: *See*—
Muller, Jean-Claude; and Ramuz, Henri, 4,220,772, Cl. 544-255.000.

Ranco Incorporated: *See*—
Hersey, Harold E., 4,220,836, Cl. 200-83.00P.

Rao, A. Kishan: *See*—
Koppelman, Edward; Murray, Robert G.; Lapple, Charles E.; and Rao, A. Kishan, 4,220,458, Cl. 55-283.000.

Rao, Tadikonda N.; and Wilson, Thomas G., Jr., to Bell Telephone Laboratories, Incorporated. Converter drive circuit. 4,220,987, Cl. 363-21.000.

Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., to Merck & Co., Inc. Preparation of 4-aza-17-substituted-5α-androstan-3-ones useful as 5α-reductase inhibitors. 4,220,775, Cl. 546-77.000.

Rastas, Jussi K.: *See*—
Fugleberg, Sigmund P.; Hultholm, Stig-Erik; Nyman, Bror G.; and Rastas, Jussi K., 4,220,627, Cl. 423-42.000.

Raulerson, J. D., Jr., to Jacobs Engineering Group Inc. Recovering of phosphates from phosphate ore. 4,220,523, Cl. 209-17.000.

Ray, Kenneth I., to Motorola, Inc. Bus terminating and decoupling circuit. 4,220,876, Cl. 307-296.00R.

Ray, Louis F. Sheave adjustable balance crane. 4,220,246, Cl. 212-191.000.

RCA Corporation: *See*—
Ahmed, Adel A. A., 4,220,930, Cl. 330-270.000.
Coleman, Clyde F., 4,220,338, Cl. 274-2.000.
Coleman, Clyde F.; and Farley, Nicki L., 4,220,339, Cl. 274-9.00B.
Craft, Jack, 4,220,974, Cl. 358-195.100.
den Hollander, Willem, 4,220,898, Cl. 315-371.000.
Giordano, Raymond L., 4,220,873, Cl. 307-254.000.
Giordano, Raymond L., 4,220,877, Cl. 307-310.000.
Kawamoto, Hirohisa; and Allen, Elmer L., Jr., 4,220,915, Cl. 324-58.00A.
Ruth, Linus C., 4,220,919, Cl. 324-404.000.
Spak, Mark A., 4,220,706, Cl. 430-318.000.
Torrington, Leslie A.; and Huff, Larry D., 4,220,340, Cl. 274-13.00R.
van Raalte, John A., 4,220,892, Cl. 313-422.000.
Wu, Chin Tao, 4,220,925, Cl. 328-150.000.

Recaro GmbH & Co.: *See*—
Strien, Werner; Goldner, Walther; and Venieris, George J., 4,220,308, Cl. 248-424.000.

Redmerski, Thomas S.: *See*—
Anastasi, James; and Redmerski, Thomas S., 4,220,807, Cl. 174-36.000.

Reed, Robert D.; and Goodnight, Hershel E., to John Zink Company. Gas burner for flame adherence to tile surface. 4,220,444, Cl. 431-348.000.

Reed, William G.: *See*—
Shade, Russell L., Jr.; Reed, William G.; and Mazer, Jack S., 4,220,194, Cl. 165-1.000.

Reicher, Harold J.; and Hepler, Leslie M., to AMSTED Industries Incorporated. Thermal monitor for railroad wheels. 4,220,300, Cl. 246-169.00A.

Reichlin, Anton; Richter, Harald; and Paluschinski, Hans, to Contraves AG. Control panel for an electronic device. 4,220,999, Cl. 364-900.000.

Reichmann, Wolfgang; Konig, Klaus; and Nordmann, Heinz-Georg, to Bayer Aktiengesellschaft. Process for the production of modified polyisocyanates. 4,220,749, Cl. 528-44.000.

Reinhardt, Bruce A.; and Arnold, Fred E., to United States of America, Air Force. Thermally stable aromatic enyne polyimides. 4,220,750, Cl. 528-172.000.

Reinhold, Donald F.: *See*—
Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., 4,220,775, Cl. 546-77.000.

Reinitz, Willard O.; and Phillips, Leland G., to Safetran Systems Corporation. Pivoting breakaway coupling system. 4,219,969, Cl. 49-141.000.

Reip, Raymond G., to Vapor Corporation. Switching valve. 4,220,074, Cl. 91-453.000.

Reiterer, Franz: *See*—
Prohaska, Helmut; Reiterer, Franz; Bretthauer, Klaus; and Kloss, Helmut, 4,220,484, Cl. 148-6.300.

Relocator AG: *See*—
Hart, Michael G., 4,219,982, Cl. 52-641.000.

Remington Products, Inc.: *See*—
Franko, Joseph P.; and Marchetti, Michael J., 4,219,930, Cl. 30-43.920.

Remy, David C., to Merck & Co., Inc. Antipsychotic levorotatory enantiomers of 3-halocyproheptadines, analogs and derivatives. 4,220,651, Cl. 424-267.000.

Renner, Alfred; and Zahir, Sheik A., to Ciba-Geigy Corporation. Curable mixtures based on maleimide prepolymers and acetone-anil. 4,220,741, Cl. 525-422.000.

Reprographic Materials, Inc.: *See*—
Brynko, Carl; and Brynko, Carl G., 4,220,698, Cl. 430-109.000.

Retsky, Michael W.: *See*—
Miller, Philip C.; and Retsky, Michael W., 4,220,893, Cl. 313-450.000.

Rexnord Inc.: *See*—
Sheldon, Jerome F., 4,220,052, Cl. 474-207.000.

Reynolds, Alfred L., to Federer, James P. Fuel vaporizer. 4,220,127, Cl. 123-522.000.

Rhone-Poulenc Industries: *See*—
Cosnard, Jean-Claude; Sarafinof, Pierre; and Vitat, Jean-Claude, 4,220,448, Cl. 8-142.000.
Cotrel, Claude; Jeanmart, Claude; Messer, Mayer N.; and Crisan, Cornel, 4,220,646, Cl. 424-250.000.
Fouassier, Claude; Garcia, Alain; and Latourrette, Bertrand, 4,220,551, Cl. 252-301.40F.

Rhyins, Richard W.; and Hurkmans, Antoon M., to Burroughs Corporation. Electro-optical document reader. 4,220,978, Cl. 358-293.000.

Ricciuti, Gaetano: *See*—
Zurawin, Adam; and Ricciuti, Gaetano, 4,219,899, Cl. 15-144.00A.

Rice, James D. Telescoping camper. 4,220,370, Cl. 296-165.000.

Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., to Fluorocarbon Company, The. Method and apparatus utilizing a porous vitreous carbon body particularly for fluid heating. 4,220,846, Cl. 219-381.000.

Rich Products Corporation: *See*—
Kahn, Marvin L.; and Eapen, Kuttikandathil E., 4,220,671, Cl. 426-321.000.

Richco Plastic Company: *See*—
Gename, John L., 4,220,293, Cl. 242-86.100.

Richter, Gerhard; and Stein, Klaus, to Vorwerk & Co Interholding GmBH. Drive mechanism. 4,220,231, Cl. 192-82.00T.

Richter, Harald: *See*—
Reichlin, Anton; Richter, Harald; and Paluschinski, Hans, 4,220,999, Cl. 364-900.000.

Ricoh Co., Ltd.: *See*—
Ishida, Tsutomu; and Iwaoka, Takehiko, 4,220,699, Cl. 430-126.000.

Riddel, John W., to General Motors Corporation. Vehicle road speed control system with flow amplifier. 4,220,218, Cl. 180-176.000.

Rigdon, Robert W. Knee brace for preventing injury from lateral impact. 4,219,892, Cl. 2-24.000.

Rinehart, Robert E., to Uniroyal, Inc. Thermoplastic elastomeric blend of monoolefin copolymer rubber, amorphous polypropylene resin and crystalline polyolefin resin. 4,220,579, Cl. 260-33.6AQ.

Ringness, Robert F., to Caterpillar Tractor Co. Weld joint hardbar main frame. 4,220,216, Cl. 180-9.500.

Rinker, Kurt H.; and Evans, Anthony C., to Kelsey Hayes Co. Sliding caliper disc brake friction pad assemblies. 4,220,223, Cl. 188-73.100.

Ripple, Warren. Loudspeaker equipment. 4,220,220, Cl. 181-148.000.

Ritchie, Leon T.; and Woratyla, John A., to AMP Incorporated. Bussing connector. 4,220,382, Cl. 339-17.0LM.

Rittersdorf, Walter; Tiedemann, Hugo; Werner, Wolfgang; and Wielinger, Hans, to Boehringer Mannheim GmbH. Stabilized diagnostic agent. 4,220,713, Cl. 435-14.000.

Ritzenthaler, Donald R., to Gulf & Western Manufacturing Company. Electromechanical relay with manual override control. 4,220,937, Cl. 335-186.000.

Robatel, S.L.P.I.: *See*—
Miachon, Jean-Paul, 4,220,279, Cl. 233-3.000.

Roberson, James E., Jr.: *See*—
Roberson, James E., Sr.; and Roberson, James E., Jr., 4,220,110, Cl. 114-315.000.

Roberson, James E., Sr.; and Roberson, James E., Jr. Underwater propulsion unit. 4,220,110, Cl. 114-315.000.

Robert Bosch GmbH: *See*—
Heitmann, Jurgen; and Maly, Hans-Peter, 4,220,965, Cl. 358-22.000.
Utz, Eberhard; Fehrenbach, Siegfried; Klett, Dittmar; Bertsch, Richard; and Knapp, Heinrich, 4,220,123, Cl. 123-327.000.

Roberts, Robert W.: *See*—
Pfeiffer, Ronald E.; and Roberts, Robert W., 4,220,616, Cl. 264-206.000.

Robertshaw Controls Company: *See*—
Barker, Charles E., 4,220,840, Cl. 219-10.55B.
Combs, Charles M.; and Goodwin, Perry H., Jr., 4,221,004, Cl. 367-114.000.

Robertson, George H., to Sun Chemical Corporation. Process for treating azo pigments. 4,220,473, Cl. 106-23.000.

Robillard, Jean J., to Roval S.A. Method of photographic trichromatic printing. 4,220,701, Cl. 430-151.000.

Robinson, Charles H. Bowling ball storage and transportation apparatus. 4,220,343, Cl. 280-33.99T.

Robinson, John W.: *See*—
Howell, Stephen L.; Dietrich, Ralph N.; Robinson, John W.; and Osburn, James P., 4,220,068, Cl. 84-1.030.

Robison, Herbert D., to Nute, Gordon B., a part interest. Apparatus for deionizing liquids with ion exchange resins. 4,220,531, Cl. 210-189.000.

Rockwell International Corporation: *See*—
Eshghy, Siavash, 4,219,920, Cl. 29-407.000.
Eshghy, Siavash, 4,219,921, Cl. 29-407.000.
Eshghy, Siavash, 4,219,922, Cl. 29-407.000.
Frye, Eugene O., 4,220,955, Cl. 343-703.000.
Loyd, Morris S., 4,219,980, Cl. 52-309.100.
Weisert, Edward D.; and Agrawal, Suphal P., 4,220,276, Cl. 228-118.000.

Rockwell-Rimoldi S.p.A.: *See*—
Draghiccio, Pietro; and Villa, Enrico, 4,220,102, Cl. 112-200.000.
Palacino, Giovanni, 4,220,105, Cl. 112-287.000.

Rodriguez, Claude: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Rodriguez, Claude, 4,220,393, Cl. 339-221.00M.

Roessler, Peter: *See*—
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,220,663, Cl. 424-330.000.

Rogatkin, Alexandr A.: *See*—
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Rohlfing, Wolfgang; and Vanheiden, Peter, to Dynamit Nobel Aktiengesellschaft. Polyvinylidene fluoride compositions of improved thermal stability. 4,220,572, Cl. 260-45.95L.

Rohm GmbH: *See*—
Berg, Alexander; Eckmayer, Zdenek; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,724, Cl. 435-273.000.
Eckmayer, Zdenek; Berg, Alexander; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,220,723, Cl. 435-265.000.

Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,220,468, Cl. 71-124.000.

Rohmann, Siegfried, to Westofen GmbH. Ovens. 4,220,319, Cl. 266-89.000.

Romanos, Nicholas D., to Combustion Engineering, Inc. Plate tube spacer structure. 4,220,199, Cl. 165-134.00R.

Ronald, Robert C.: *See*—
Gurusiddaiah, Sarangamat; Ronald, Robert C.; Magnuson, James A.; and McFadden, Bruce A., 4,220,718, Cl. 435-124.000.

Rondo, A.G.: *See*—
Shavit, Henri, 4,220,238, Cl. 198-400.000.

Rooney, James H., III: *See*—
Brossman, William C.; McElhaney, Joseph G.; and Rooney, James H., III, 4,220,115, Cl. 118-684.000.

Roquemore, William D.: *See*—
Jackson, Jimmy; and Roquemore, William D., 4,220,208, Cl. 169-17.000.

Rosa, John, to Westinghouse Electric Corp. Thyristor tap changer for electrical inductive apparatus. 4,220,911, Cl. 323-43.50S.

Rosch, Guter: *See*—
Erckel, Rudiger; Schmidt, Erwin; Eckes, Helmut; and Rosch, Guter, 4,220,760, Cl. 542-460.000.

Rosen, Linda J.: *See*—
Rosen, Raymond C.; Rosen, Linda J.; and Sisko, Zoltan L., 4,220,142, Cl. 128-1.00R.

Rosen, Raymond C.; Rosen, Linda J.; and Sisko, Zoltan L., to Rosen, Raymond C.; and Rosen, Linda J. Behavioral shaping device for eliminating nocturnal sounds. 4,220,142, Cl. 128-1.00R.

Rosenberger, Siegfried, to Ciba-Geigy Corporation. Thermoplastic polyolefin composition and process for stabilizing polyolefins. 4,220,571, Cl. 260-45.9NC.

Roth, Walter L.; and Mitoff, Stephan P., to Electric Power Research Institute, Inc. Sodium sulfur cell. 4,220,691, Cl. 429-104.000.

Roueche, Armand: *See*—
Cseh, Georg; Roueche, Armand; and Hari, Stefan, 4,220,586, Cl. 260-157.000.

Roval S.A.: *See*—
Robillard, Jean J., 4,220,701, Cl. 430-151.000.

Rovnyak, George C., to E. R. Squibb & Sons, Inc. Mercaptoacylpyrazolidinone carboxylic acid derivatives. 4,220,791, Cl. 548-367.000.

Rowatt, Robert J., to Gulf Oil Corporation. Bingham fluid compositions. 4,220,580, Cl. 260-33.6PQ.

Rowley, Gerald L.; Leung, Danton; and Singh, Prithiphal, to Syva Company. Method for conjugating to polyamino compounds employing haloacyl groups and compositions prepared thereby. 4,220,722, Cl. 435-188.000.

RTE Corporation: *See*—
Huber, William J., 4,220,940, Cl. 337-231.000.

Rudolph, Hans: *See*—
Mietzsch, Fritz; Rudolph, Hans; Wolfers, Heinrich; and Alberts, Heinrich, 4,220,742, Cl. 526-209.000.

Rudy, Marion F., to Bogert, Robert C., a part interest. Footwear. 4,219,945, Cl. 36-29.000.

Ruehr, William C.; Younghans, James L.; and Smith, Edwin B., to United States of America, National Aeronautics and Space Administration. Curved centerline air intake for a gas turbine engine. 4,220,171, Cl. 137-15.100.

Rumennik, Vladimir, to International Rectifier Corporation. Fast recovery diode with very thin base. 4,220,963, Cl. 357-55.000.

Rupp, Gary P.: *See*—
Kimberling, Cleon V.; and Rupp, Gary P., 4,220,155, Cl. 128-306.000.

Russell, Burdsall & Ward Corporation: *See*—
McMurray, John C., 4,220,188, Cl. 151-37.000.

Russell, Gordon A.: *See*—
Bleiman, Arnold M.; and Russell, Gordon A., 4,220,481, Cl. 134-6.000.

Russell, Larry R. Methods and apparatus for controlling fluid flow. 4,220,176, Cl. 137-496.000.

Ruth, Linus C., to RCA Corporation. Cathode ray tube display error measurement apparatus and method. 4,220,919, Cl. 324-404.000.

Ruzic, Hugo, to International Standard Electric Corporation. Telephone subset. 4,220,828, Cl. 179-100.00D.

Ruzic, Hugo, to International Standard Electric Corporation. Telephone handset. 4,220,829, Cl. 179-103.000.

Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,220,253, Cl. 220-338.000.

Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 4,220,253, Cl. 220-338.000.

S. A. Clark & Associates: *See*—
Clark, Scott A.; and Ulmer, William E., 4,220,950, Cl. 340-594.000.

S & C Electric Company: *See*—
Meister, Otto; and Tobin, Thomas J., 4,220,942, Cl. 337-277.000.

S. C. Johnson & Son, Inc.: *See*—
Martens, Edward J., III; and Neumiller, Phillip J., 4,220,281, Cl. 239-57.000.

Sabacky, Milton J.: *See*—
Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., 4,220,590, Cl. 260-326.14T.

Sacks, Jacob M.: *See*—
Ichida, LeRoy F.; Sturla, Robert A.; and Sacks, Jacob M., 4,220,967, Cl. 358-105.000.

Saeki, Keiso: *See*—
Usui, Hideo; Ishige, Sadao; and Saeki, Keiso, 4,220,356, Cl. 282-27.500.

Safe-T-Gard, Inc.: *See*—
Jacobs, Alfred G.; and Seiders, Richard L., 4,220,301, Cl. 248-74.0PB.

Safetran Systems Corporation: *See*—
Reinitz, Willard O.; and Phillips, Leland G., 4,219,969, Cl. 49-141.000.

Sahni, Omesh: *See*—
Alt, Paul M.; and Sahni, Omesh, 4,221,002, Cl. 365-111.000.

Said, Sami I.; and Mutt, Viktor. Vasoactive lung polypeptides. 4,220,642, Cl. 424-177.000.

Saigusa, Tetsuji: *See*—
Koga, Tomohiro; Saigusa, Tetsuji; and Kadono, Mamoru, 4,220,180, Cl. 138-120.000.

St. Clair Fisheries: *See*—
Fuller, Derek E., 4,219,907, Cl. 17-46.000.

St. Clair Fisheries Ltd.: *See*—
Crossland, John S.; Grimstead, David; and Guy, Simon P., 4,219,906, Cl. 17-46.000.

St. Pierre, Philippe D.; Morelock, Charles R.; and Birle, John D., to General Electric Company. Polycrystalline diamond and/or cubic boron nitride body and process for making said body. 4,220,455, Cl. 51-295.000.

Saito, Yasuo: *See*—
Nagashima, Akira; and Saito, Yasuo, 4,219,932, Cl. 30-381.000.

Saitoh, Masayuki: *See*—
Chiba, Yasutsune; Arima, Shizuo; Suzuki, Shoji; and Saitoh, Masayuki, 4,220,910, Cl. 323-19.000.

Sakai, Yukio; and Iida, Teiji, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automobile door window glass system. 4,219,968, Cl. 49-40.000.

Sakamoto, Hirokatsu: *See*—
Ohashi, Masao; and Sakamoto, Hirokatsu, 4,220,073, Cl. 91-438.000.

Sakamoto, Hiroshi: *See*—
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, 4,220,891, Cl. 313-345.000.

Sakuma, Nobuaki: *See*—
Kimura, Michio; Izawa, Nobuyuki; and Sakuma, Nobuaki, 4,220,088, Cl. 102-28.00R.

Salamon, Theodore M.: *See*—
Cataldo, Roy S.; and Salamon, Theodore M., 4,220,354, Cl. 280-803.000.

Samanta, Mrinmay. Low temperature synthesis of vitreous bodies and their intermediates. 4,220,461, Cl. 65-22.000.

Sammatti, Pekka T., to Oy Nokia AB. Flotation purification apparatus. 4,220,532, Cl. 210-221.00R.

Sammells, Anthony F.: *See*—
Blurton, Keith F.; and Sammells, Anthony F., 4,220,690, Cl. 429-15.000.

Sanborn, Duane F.: *See*—
Bergman, Mark O.; Leary, John W.; Sanborn, Duane F.; and Ware, Chester D., 4,220,011, Cl. 62-185.000.

Sanders, Edward B.; Secor, Henry V.; and Seeman, Jeffrey I., to Philip Morris, Inc. Process for preparing 2-alkyl nicotinoids. 4,220,781, Cl. 546-193.000.

Sandoz, Inc.: *See*—
Anderson, Paul L.; and Paolella, Nicholas A., 4,220,792, Cl. 548-378.000.
Wolf, Harold P., 4,220,611, Cl. 260-929.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 4,220,449, Cl. 8-606.000.
Mauric, Claudine; and Wolf, Rainer, 4,220,472, Cl. 106-18.180.
Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Hari, Eugen, 4,220,641, Cl. 424-177.000.

Sanford, Gary G., to Ball Corporation. Collinear series-fed radio frequency antenna array. 4,220,956, Cl. 343-706.000.

Sanko Chemical Co. Ltd.: *See*—
Imamura, Juichi, 4,220,605, Cl. 568-432.000.

Sano, Hiromi; and Suzuki, Masatoshi, to Nippondenso Co., Ltd. Oxygen sensor. 4,220,516, Cl. 204-195.00S.

Sanritsu Denki Kabushikikaisha: *See*—
Sugibuchi, Shigeyoshi; Hiramatsu, Mitsuo; and Aizawa, Takeo, 4,220,705, Cl. 430-294.000.

Sanyo Electric Co. Ltd.: *See*—
Ikeguchi, Shigehiko, 4,220,922, Cl. 455-182.000.

Saperov, Evgeny V.: *See*—
Aladiev, Ivan T.; Voskresensky, Kirill D.; Gukov, Gennady P.; Saperov, Evgeny V.; and Fardzinov, Valery K., 4,220,202, Cl. 166-57.000.

Sarafinof, Pierre: *See*—
Cosnard, Jean-Claude; Sarafinof, Pierre; and Vitat, Jean-Claude, 4,220,448, Cl. 8-142.000.

Saratoga Sunroof Corporation: *See*—
Ferrigan, Paul J., 4,220,368, Cl. 296-215.000.

Sasaguri, Kiichiro: *See*—
Ohmura, Kaoru; Sasaguri, Kiichiro; and Toyomoto, Kazuo, 4,220,707, Cl. 430-325.000.

Sassano, Daniel R.; and Fink, William H., to Westinghouse Electric Corp. Method of making a high temperature capability water soluble polyester insulating resin solution. 4,220,752, Cl. 528-289.000.

Sasse, Klaus: *See*—
Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, 4,220,663, Cl. 424-330.000.

Sato, Masanori: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,220,059, Cl. 74-865.000.

Sato, Moriyuki; and Mori, Yasuki, to Abbott Laboratories. Fortimicin B derivatives and process for production thereof. 4,220,755, Cl. 536-17.00R.

Satomi, Yoshihito: *See*—
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.

Satomura, Hiroshi; and Takano, Katsuyoshi, to Toko, Inc. Piezoelectric ceramic compounds. 4,220,546, Cl. 252-62.900.

Sauerwein, Kurt; and Goedecke, Hans, to Sauerwein, Kurt. Radiographic apparatus. 4,220,864, Cl. 250-497.000.

Savage, William T.: *See*—
Dorsey, Robert J.; Okunami, Hideo; and Savage, William T., 4,220,442, Cl. 425-344.000.

Sawada, Kazuo: *See*—
Kotani, Yasutoyo; Sawada, Kazuo; Nagai, Shuzo; Ogino, Takao; and Watabe, Seiji, 4,220,508, Cl. 204-129.650.

Scardera, Michael: *See*—
Wojtowicz, John A.; and Scardera, Michael, 4,220,768, Cl. 544-190.000.

Scata, Umberto; Luciani, Luciano; and Barbe, Pier C., to Montedison S.p.A. Components of catalysts for polymerizing alpha-olefins and the catalysts formed from the components. 4,220,554, Cl. 252-429.00B.

Schaefer, Donald D.; Shaw, David N.; and Gagnon, Joseph A. M., to Dunham-Bush, Inc. High speed variable delivery helical screw compressor/expander automotive air conditioning and waste heat energy recovery system. 4,220,197, Cl. 165-35.000.

Schaefer, Klaus-Dieter, to Ernst Leitz Wetzlar GmbH. Optical electronic focusing device. 4,220,406, Cl. 354-25.000.

Schafer, Curtiss R., to Electro-Physical Research, Incorporated. Hearing aid with modulated suppressed carrier signal. 4,220,830, Cl. 179-107.00R.

Schatz, Friedrich: *See*—
Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, 4,220,179, Cl. 138-113.000.

Scheetz, John L. Heavy wire bending tool. 4,220,036, Cl. 72-458.000.

Scheffler, Ernst; Schatz, Friedrich; and Ziemek, Gerhard, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Spacer for coaxial tube systems. 4,220,179, Cl. 138-113.000.

Scheingold, William S.; and Youngfleish, Frank C., to AMP Incorporated. Surface to surface connector. 4,220,383, Cl. 339-17.0CF.

Schell, Lorenz P., to Olin Corporation. Catalytic method for hydrolyzing urea. 4,220,635, Cl. 423-358.000.

Schell, Mark S., to Du Pont de Nemours, E. I., and Company. Circuit card connector. 4,220,389, Cl. 339-74.00R.

Schenk, Norbert: *See*—
Halcourt, Kurt; Losacker, Paul; Martin, Manfred; Schenk, Norbert; and Schwerdtel, Wulf, 4,220,597, Cl. 260-369.000.

Scherbel, Gordon H.: *See*—
Tarum, Arden V.; and Scherbel, Gordon H., 4,220,317, Cl. 266-45.000.

Schermerhorn, Jerry D.: *See*—
Miller, Peter S.; and Schermerhorn, Jerry D., 4,220,077, Cl. 93-80.000.

Schildkraut, Alan L.: *See*—
Luca, Vincent A., Jr.; Knapp, Carl L.; and Schildkraut, Alan L., 4,220,385, Cl. 339-59.00M.

Schilling, Robert A.: *See*—
Hughes, Horatio, Jr.; and Schilling, Robert A., 4,220,499, Cl. 162-49.000.

Schloeman, Robert W., to Sperry Corporation. Engine throttle control system. 4,220,993, Cl. 364-431.000.

Schlossberg, Howard R. Near millimeter wavelength electromagnetic filter. 4,220,399, Cl. 350-163.000.

Schlosser, Karl-Heinz: *See*—
Wehr, Hubert; and Schlosser, Karl-Heinz, 4,220,493, Cl. 156-380.000.

Schlumberger Technology Corporation: *See*—
Lands, Jack F., Jr., 4,220,212, Cl. 175-4.000.

Schmalbach-Lubeca GmbH: *See*—
Supik, Helmuth, 4,220,106, Cl. 113-120.00Y.

Schmidhammer, Ludwig: *See*—
Dempf, Dominik; Knabl, Rudolf; Schmidhammer, Ludwig; and Mack, Wilhelm, 4,220,607, Cl. 260-652.50R.

Schmidt, Erich, to Maschinenfabrik Zuckermann Komm. Ges. Copy-grinding apparatus. 4,219,974, Cl. 51-101.00R.

Schmidt, Erwin: *See*—
Erckel, Rudiger; Schmidt, Erwin; Eckes, Helmut; and Rosch, Guter, 4,220,760, Cl. 542-460.000.

Schmidt, Otto, to Dipl. Ing. A. Berglein. File folder with fastening mechanism on the inside. 4,219,951, Cl. 40-530.000.

Schmidt, Paul J.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,220,357, Cl. 282-27.500.

Schmitt, Lothar: *See*—
Schneider, Max; Schmitt, Lothar; and Heise, Hartmut, 4,220,601, Cl. 260-562.00R.

Schnapp, John P.: *See*—
Wilber, Dennis A.; and Schnapp, John P., 4,220,008, Cl. 60-602.000.

Schnegelberger, Harald: *See*—
Bruns, Klaus; Conrad, Jens; Meins, Peter; Moller, Hinrich; and Schnegelberger, Harald, 4,220,593, Cl. 260-340.700.

Schneider, Manfred: *See*—
Schubert, Frank; and Schneider, Manfred, 4,220,274, Cl. 226-34.000.

Schneider, Max; Schmitt, Lothar; and Heise, Hartmut, to Hoechst Aktiengesellschaft. Process for the continuous manufacture of 3-nitro-4-acetylamino-toluene and corresponding apparatus. 4,220,601, Cl. 260-562.00R.

Schneider, Walter C.: *See*—
Foster, Joseph J., Jr.; and Schneider, Walter C., 4,220,363, Cl. 292-164.000.

Scholler, Martin. Skate sharpener. 4,219,975, Cl. 51-205.0WG.

Scholz, Herbert, to BASF Aktiengesellschaft. Preparation of oxazolidine-2,4-diones. 4,220,787, Cl. 548-226.000.

Scholz, Werner, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Circuit for generating a constant reference oscillation from a video signal affected by a time error. 4,220,968, Cl. 358-127.000.

Schott, Jeffrey H.; Palmer, David A.; and Schroeder, Hobe, to Standard Oil Company. Separation of phthalic anhydride from vapor mixture also containing water vapor. 4,220,596, Cl. 260-346.700.

Schottel-Werft Josef Becker GmbH & Co. KG: *See*—
Krautkremer, Franz; and Lais, Siegfreid, 4,220,111, Cl. 440-53.000.

Schottle, Helmut A. M.; and Muller, Helmut, to Pitney Bowes Inc. Low-noise printing device. 4,220,085, Cl. 101-316.000.

Schrader, Clarence O.: *See—*
Hanley, William H.; and Schrader, Clarence O., 4,220,504, Cl. 204-15.000.

Schroder, Johann: *See—*
Gawron, Klaus; Mahdjuri, Faramarz; and Schroder, Johann, 4,220,196, Cl. 165-11.00R.

Schroder, Rolf: *See—*
Stemme, Otto; Wagner, Karl; Lermann, Peter; Schroder, Rolf; and Utschig, Peter, 4,220,407, Cl. 354-126.000.

Schroeder, Gary P. Illuminated bowsight. 4,220,983, Cl. 362-114.000.

Schroeder, Hobe: *See—*
Schott, Jeffrey H.; Palmer, David A.; and Schroeder, Hobe, 4,220,596, Cl. 260-346.700.

Schubert, Frank; and Schneider, Manfred, to Textima Veb Wirkmaschinenbau. Device for feeding yarn in textile machines. 4,220,274, Cl. 226-34.000.

Schuff, Richard W., to Newbery Energy Corporation. Method for removing particulate matter from a gas stream and a method for producing a product using the removed particulate matter. 4,220,478, Cl. 106-281.00R.

Schulein, Rolf G.: *See—*
Leibscher, Johannes; and Schulein, Rolf G., 4,219,897, Cl. 15-41.00R.

Schulman, Joseph H.; and Morgan, Wayne A., to Pacesetter Systems, Inc. Low power implantable apparatus and method for receiving an AM signal. 4,220,156, Cl. 128-419.00R.

Schulze, Andreas; Sasse, Klaus; Naumann, Klaus; Roessler, Peter; and Kraus, Peter, to Bayer Aktiengesellschaft. Combating pests with benzyl phenyl ethers. 4,220,663, Cl. 424-330.000.

Schumacher, William J.; and Tanczyn, Harry, to Armco Inc. Galling resistant austenitic stainless steel powder product. 4,220,689, Cl. 428-558.000.

Schumann, Gunter, to Messer Griesheim GmbH. System for guiding a tool. 4,220,903, Cl. 318-577.000.

Schutze, Detlef-Ingo: *See—*
Ehrig, Volker; Bien, Hans-Samuel, deceased; Klauke, Erich; and Schutze, Detlef-Ingo, 4,220,779, Cl. 546-152.000.

Schwerdtel, Wulf: *See—*
Halcourt, Kurt; Losacker, Paul; Martin, Manfred; Schenk, Norbert; and Schwerdtel, Wulf, 4,220,597, Cl. 260-369.000.

Scienco, Inc.: *See—*
Dankman, Scott; Levy, Richard C.; and McCoy, Bryan L., 4,219,962, Cl. 46-232.000.

Scolastico, Carol; and Tronconi, Giovanni. 19-Methyl-9-keto-15-hydroxy-prost-18-enoic acid derivatives and process of their preparation. 4,220,798, Cl. 560-121.000.

Scott, David B., to Stanley Tools Limited. Abrading tool blades and method of making same. 4,219,915, Cl. 29-78.000.

Scott & Fetzer Company, The: *See—*
Burgoon, Jack L.; and Knowlton, Christopher M., 4,219,901, Cl. 15-352.000.

Scott, William J., to Ideal Industries, Inc. Screw-on electrical connector. 4,220,811, Cl. 174-87.000.

Scripps Clinic & Research Foundation: *See—*
Katz, David H., 4,220,565, Cl. 260-6.000.

Seaholm, Reuel A.: *See—*
Wiles, Bradford; and Seaholm, Reuel A., 4,219,979, Cl. 52-204.000.

Searcy, Talmadge R. Jogger's computational device. 4,220,996, Cl. 364-561.000.

Secor, Henry V.: *See—*
Sanders, Edward B.; Secor, Henry V.; and Seeman, Jeffrey I., 4,220,781, Cl. 546-193.000.

Seeman, Jeffrey I.: *See—*
Sanders, Edward B.; Secor, Henry V.; and Seeman, Jeffrey I., 4,220,781, Cl. 546-193.000.

Segafredo, Andre J., to Pomagalski, S.A. Overhead cable transport installation with a device for monitoring the components supporting the cable. 4,220,095, Cl. 104-179.000.

Segerstrom, Kjell E. L.: *See—*
Norberg, Gustav S. I.; and Segerstrom, Kjell E. L., 4,220,240, Cl. 198-408.000.

Seicho Machinary Co., Ltd.: *See—*
Takahashi, Risaburo; and Takahashi, Mitsuo, 4,220,537, Cl. 210-333.00R.

Seidel, John G., to Westinghouse Electric Corp. Radiation dosimeter assembly. 4,220,852, Cl. 250-253.000.

Seiderman, Abe. Conversion kit for semi-automatic carbines. 4,220,071, Cl. 89-128.000.

Seiders, Richard L.: *See—*
Jacobs, Alfred G.; and Seiders, Richard L., 4,220,301, Cl. 248-74.0PB.

Seiko Seiki Kabushiki Kaisha: *See—*
Ota, Masato; and Koike, Kisaburo, 4,219,972, Cl. 51-5.00D.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Kodera, Yoshiaki; Watanabe, Kiyoyuki; and Kusu, Takayuki, 4,220,736, Cl. 525-154.000.

SELO Societa Electtronica Lombarda S.p.A.: *See—*
Colombo, Sergio; and Terra, Luigi, 4,220,861, Cl. 250-363.00S.

Semm, Kurt. Device for coagulating biological tissue. 4,220,154, Cl. 128-303.100.

Sensinger, Wilbur A.: *See—*
Matteo, Gene T.; and Sensinger, Wilbur A., 4,220,986, Cl. 362-362.000.

Serbent, Harry; Eichberger, Heinz; Lommert, Hermann; Lausch, Herbert; and Steinhofel, Horst, to Metallgesellschaft Aktiengesellschaft. Process of calcining limestone or hydrated lime in a rotary kiln. 4,220,631, Cl. 423-175.000.

Serber, Stephen L.: *See—*
Mueller, Dale A.; and Serber, Stephen L., 4,220,010, Cl. 62-126.000.

Serreyn, David V.: *See—*
Geokezas, Meletios; Larson, Rodney M.; and Serreyn, David V., 4,220,972, Cl. 358-166.000.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D., 4,220,201, Cl. 166-55.200.

Severson, Verne L.: *See—*
Hines, William E.; and Severson, Verne L., 4,220,931, Cl. 330-284.000.

Shade, Russell L., Jr.; Reed, William G.; and Mazer, Jack S., to General Electric Company. Scavenging of throttled MSR tube bundles. 4,220,194, Cl. 165-1.000.

Shaffer, Robert: *See—*
Burack, Robert D.; and Shaffer, Robert, 4,219,976, Cl. 51-411.000.

Shah, Kanu G., to Dana Corporation. Gasket having polysiloxane sealant layer containing organotitanate. 4,220,342, Cl. 277-228.000.

Shah, Manhar L.: *See—*
Wang, Shyh; Shah, Manhar L.; and Crow, John D., 4,220,395, Cl. 350-96.120.

Shanklin Corporation: *See—*
Shanklin, Frank G.; and King, Francis X., Jr., 4,219,988, Cl. 53-550.000.

Shanklin, Frank G.; and King, Francis X., Jr., to Shanklin Corporation. Automatic high-speed wrapping machine. 4,219,988, Cl. 53-550.000.

Sharpell, Frederick H., Jr.: *See—*
Brandman, Harold A.; Freudewald, Joachim E.; Manowitz, Milton; Nikawitz, Edward J.; and Sharpell, Frederick H., Jr., 4,220,577, Cl. 260-29.6MN.

Shavit, Henri, to Rondo, A.G. Apparatus for arraying randomly distributed objects. 4,220,238, Cl. 198-400.000.

Shaw, David N.: *See—*
Schaefer, Donald D.; Shaw, David N.; and Gagnon, Joseph A. M., 4,220,197, Cl. 165-35.000.

Shay, Joseph J., to Ethyl Corporation. Pressure fillable dispensing device. 4,220,265, Cl. 222-402.200.

Shekar, Hiriyur V.: *See—*
Fey, Robert M.; and Shekar, Hiriyur V., 4,220,232, Cl. 192-103.00B.

Sheldon, Jerome F., to Rexnord Inc. Pin retention by interference fit differential. 4,220,052, Cl. 474-207.000.

Shell Oil Company: *See—*
van der Graaf, Gerardus C., 4,220,381, Cl. 339-16.00C.

Sheltra, Russell G., Sr. Supplemental coin acceptor/rejector mechanism for coin operated machines. 4,220,234, Cl. 194-1.00G.

Shen, Chen S.: *See—*
Kresta, Jiri; and Shen, Chen S., 4,220,728, Cl. 521-121.000.

Sheppard, John C.: *See—*
Ban, Thomas E.; Sheppard, John C.; and Marlowe, William H., 4,220,454, Cl. 48-202.000.

Sherwood Medical Industries Inc.: *See—*
Whitney, Edgar H., 4,220,151, Cl. 128-218.00N.

Shiba, Keisuke: *See—*
Furutachi, Nobuo; Nakamura, Kotaro; Arai, Atsuaki; Yamada, Minoru; and Shiba, Keisuke, 4,220,470, Cl. 430-387.000.

Shichi, Shigeharu: *See—*
Kasahara, Takahiko; Shichi, Shigeharu; and Suito, Senji, 4,220,103, Cl. 112-260.000.

Shinagawa Refractories Co., Ltd.: *See—*
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.

Shinohara, Koichi, to Matsushita Electric Industrial Co., Ltd. Apparatus for fabrication of magnetic recording media. 4,220,117, Cl. 118-718.000.

Shiomura, Tetsunosuke: *See—*
Tanaka, Takao; Asanuma, Tadashi; Shiomura, Tetsunosuke; and Ito, Akira, 4,220,745, Cl. 526-125.000.

Shionogi & Co., Ltd.: *See—*
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,220,766, Cl. 544-182.000.

Shirasaka, Tadashi: *See—*
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,220,587, Cl. 260-239.100.

Shirataki, Tsutomu: *See—*
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.

Shoda, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for detecting tip damages of a milling cutter. 4,220,995, Cl. 364-508.000.

Shoda, Makoto: *See—*
Udaka, Shigezo; and Shoda, Makoto, 4,220,527, Cl. 210-12.000.

Sholl, Howard A.; and Marshall, John T., to Dapco Industries, Inc. System for non-destructively acquiring and processing information about a test piece. 4,220,049, Cl. 73-636.000.

Shomura, Takashi: *See—*
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.

Shroyer, Richard A.; and Martin, William A., to Eastman Kodak Company. Illuminant discrimination apparatus and method. 4,220,412, Cl. 356-218.000.
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N. Electrolyte for electrochemical polishing of articles made of titanium and titanium alloys. 4,220,509, Cl. 204-129.950.
Shulyak, Lev, to Norman S. Blodgett. Hingedly connected triangular elements. 4,219,958, Cl. 46-1.00R.
Shut, Nina A.: *See—*
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.
SIDRO GmbH & Co. Ludwig Moller: *See—*
Koser, Rolf; Haberstock, Egon; Breidenbend, Anton; and Wonderschutz, Manfred, 4,220,028, Cl. 72-117.000.
Siemens Aktiengesellschaft: *See—*
Feuerbaum, Hans-Peter; and Wolfgang, Eckhard, 4,220,853, Cl. 250-310.000.
Feuerbaum, Hans-Peter, 4,220,854, Cl. 250-310.000.
Kersten, Ralf, 4,220,619, Cl. 264-230.000.
Koch, Rudolf, 4,220,976, Cl. 358-213.000.
Taumann, Leonhard; and Symmons, Edgar B., 4,220,866, Cl. 250-513.000.
Werner, Wolfgang, 4,220,961, Cl. 357-46.000.
Sih, John C., to Upjohn Company, The. C_{1-4} alkanoylphenyl-esters of 5-hydroxy-PGI_1, Δ^4-PGI_1, and 4-oxo-PGI_1 compounds. 4,220,758, Cl. 542-426.000.
Silverman, Stanley, to Sun Chemical Corporation. Ultraviolet curing oven with rotable lamp assembly. 4,220,865, Cl. 250-504.00R.
Simmons, John H.: *See—*
Horton, Robert A.; Simmons, John H.; and Bauer, Timothy R., 4,220,190, Cl. 164-35.000.
Simo, Thomas; and Eisenlohr, Karl H., to Metallgesellschaft Aktiengesellschaft. Method of processing solids-containing oils or tars. 4,220,522, Cl. 208-177.000.
Simpson, Ronald O.; and Cabrera, Pedro P., to Coulter Electronics, Inc. Backwash system for diluting apparatus. 4,220,621, Cl. 422-103.000.
Sims, Ernest G. Retention of tags for food and beverage preparation bags. 4,220,079, Cl. 99-295.000.
Sinfelt, John H.: *See—*
Carter, James L.; and Sinfelt, John H., 4,220,520, Cl. 208-139.000.
Singer Company, The: *See—*
Austin, William R., 4,220,927, Cl. 328-181.000.
Singh, Gurdial: *See—*
Leenhouts, Albert C.; and Singh, Gurdial, 4,220,904, Cl. 318-696.000.
Singh, Prithiphal: *See—*
Rowley, Gerald L.; Leung, Danton; and Singh, Prithiphal, 4,220,722, Cl. 435-188.000.
Sirotkin, Sergei N.: *See—*
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.
Sisko, Zoltan L.: *See—*
Rosen, Raymond C.; Rosen, Linda J.; and Sisko, Zoltan L., 4,220,142, Cl. 128-1.00R.
Sivachenko, Eugene W. High strength corrugated metal plate and method of fabricating same. 4,220,423, Cl. 405-284.000.
Skaugen, Borgeir, to Beloit Corporation. Papermaking machine with means facilitating stringing, and method. 4,220,501, Cl. 162-200.000.
Skurkiss, Peter K.; and Turner, Dennis R., to Bell Telephone Laboratories, Incorporated. Process for plating solder. 4,220,506, Cl. 204-28.000.
Sky-Top Sunroofs Ltd.: *See—*
Mintz, Irwin H., 4,220,900, Cl. 318-266.000.
Slater Steel Industries Limited: *See—*
Fogarty, John E., 4,220,191, Cl. 164-57.000.
Sleeter, Thomas D.: *See—*
Mitchell, Ralph; and Sleeter, Thomas D., 4,220,688, Cl. 428-541.000.
Small, Samuel N.: *See—*
Pappas, Dennis G.; Baum, Matthew C.; Small, Samuel N.; Adams, Robert T.; and Freedman, Robert P., 4,220,907, Cl. 322-3.000.
Smialek, Raymond J.; and Morganson, Neal E., to Olin Corporation. Cyanuric acid manufacture. 4,220,769, Cl. 544-192.000.
Smiesko, Frank A.: *See—*
Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., 4,220,284, Cl. 239-242.000.
Smith, Donald C.: *See—*
Frenier, Wayne W.; Coffey, Michael D.; Huffines, James D.; and Smith, Donald C., 4,220,550, Cl. 252-180.000.
Smith, Edwin B.: *See—*
Ruehr, William C.; Younghans, James L.; and Smith, Edwin B., 4,220,171, Cl. 137-15.100.
Smith, Gary M.: *See—*
Barlow, Roland J.; and Smith, Gary M., 4,220,053, Cl. 74-425.000.
Smith, Hugh M.: *See—*
Huffner, Stanley F.; and Smith, Hugh M., 4,220,479, Cl. 106-288.00Q.
Smith International Inc.: *See—*
Crase, Gary M.; Trezeciak, Kurt H.; and Tschirky, John E., 4,220,380, Cl. 308-174.000.
Smith, John E., to Eastman Kodak Company. Sheet receiving and stacking apparatus. 4,220,323, Cl. 271-65.000.
Smith Kline & French Laboratories Limited: *See—*
Brown, Thomas H.; and Ife, Robert J., 4,220,767, Cl. 544-182.000.
Durant, Graham J.; Emmett, John C.; Ganellin, Charon R.; and Prain, Hunter D., 4,220,652, Cl. 424-270.000.
Smith, Oliver W.: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,220,569, Cl. 260-23.0EP.
Smith, Robert A., Jr., to Air Conditioning Corporation. Power press break guard. 4,220,032, Cl. 72-389.000.
Smith, Robert C.; and Webb, John H., to United States of America, Army. Leaf-spring color-disseminating projectile for training cartridge. 4,220,092, Cl. 102-92.700.
Smith, Tommy L. Baseball batting range retrieval system. 4,220,331, Cl. 273-26.00D.
Smith, William G., to United States of America, Army. Cartridge for a fully telescoped projectile. 4,220,089, Cl. 102-38.00R.
SmithKline Corporation: *See—*
Berges, David A., 4,220,644, Cl. 424-246.000.
Faulkner, Albert A., 4,220,273, Cl. 225-96.500.
Snyder, Paul V., to General Electric Company. Toaster/oven accessory container. 4,220,134, Cl. 126-390.000.
S.p.A. Cellograf-Simp: *See—*
Corsi, Pietro E., 4,220,680, Cl. 428-1.000.
Societe Anonyme Automobiles Citroen: *See—*
Mauboussin, Joel, 4,220,047, Cl. 73-313.000.
Societe Anonyme dite: CGEE ALSTHOM: *See—*
Debaigt, Jean, 4,220,392, Cl. 339-198.00N.
Societe Anonyme dite: Compagnie Generale d'Electricite: *See—*
Tardy, Andre, 4,220,394, Cl. 350-96.210.
Societe Anonyme Dite: Etablissements Catu S.A.: *See—*
Gris, Marcel P., 4,220,315, Cl. 254-236.000.
Societe d'Investissement pour le Developpement des Appareils Menagers: *See—*
Tatard, Francois, 4,220,576, Cl. 260-29.40R.
Societe Generale Pour L'Emballage: *See—*
Lagneaux, Jean, 4,220,259, Cl. 222-82.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Dubois, Claude; and Surdi, Jean M., 4,220,055, Cl. 74-573.00R.
Soeno, Ko: *See—*
Ando, Hisashi; Soeno, Ko; Sakamoto, Hiroshi; Oyama, Testuo; Kawamura, Takao; and Fukushima, Hiroshi, 4,220,891, Cl. 313-345.000.
Sohar, Paul: *See—*
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Sole, Lloyd H.: *See—*
Howell, Mark I.; and Sole, Lloyd H., 4,220,913, Cl. 324-52.000.
Sommarlund, Stanley, to ASEA Aktiebolag. Method for the manufacture of a power cable. 4,220,615, Cl. 264-174.000.
Sommer, Karlheinz; and Kohler, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Surface passivated semiconductor device and method for producing the same. 4,220,962, Cl. 357-52.000.
Sonca Industries Limited: *See—*
Wong, Chung-Chee; and Dalton, David R., 4,220,304, Cl. 248-231.000.
Sony Corporation: *See—*
Hoshimi, Susumu; and Nakagawa, Kenzo, 4,220,879, Cl. 310-68.00R.
Yamagiwa, Kazuo; and Numakura, Toshihiko, 4,220,964, Cl. 358-8.000.
Yamanaka, Seisuke, 4,220,977, Cl. 358-213.000.
SOS Consolidated, Inc.: *See—*
Feterl, Leon G., 4,220,433, Cl. 414-298.000.
Soulier, John E.: *See—*
Petersen, Kenneth M.; and Soulier, John E., 4,220,313, Cl. 251-280.000.
Spadini, Gianfranco L.; Tolliday, Ian D.; and McRitchie, Allan C., to Procter & Gamble Company, The. Laundry additive product. 4,220,562, Cl. 252-542.000.
Spak, Mark A., to RCA Corporation. Etchant solution containing HF-HnO_3-H_2SO_4-H_2O_2 for etching Al-Ti-Cu or Ni contact metallurgy on silicon substrates. 4,220,706, Cl. 430-318.000.
Spalinger, Hugo: *See—*
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, 4,220,843, Cl. 219-121.00P.
Speck, Robert M.: *See—*
Bash, Leroy A.; Cherry, Raymond B.; Speck, Robert M.; and McDuffie, William N., 4,220,951, Cl. 340-649.000.
Spector, George: *See—*
Johnson, Clarine; and Spector, George, 4,220,345, Cl. 280-43.160.
Spero, Theodore P. Pressure equalizing and stabilization device for hydraulic brake systems. 4,220,376, Cl. 303-87.000.
Sperry Corporation: *See—*
Kroger, Harry, 4,220,959, Cl. 357-5.000.
Phillips, Frederick W.; Priepke, Edward H.; and Wagstaff, Robert A., 4,220,289, Cl. 241-60.000.
Schloeman, Robert W., 4,220,993, Cl. 364-431.000.
Spisak, Edward G. Wheel trim and retainer assembly. 4,220,373, Cl. 301-37.00P.
Spitz, Russell W. Fluid control valves. 4,220,174, Cl. 137-271.000.
Sprague, Peter W., to E. R. Squibb & Sons, Inc. Hexa- and octahydro-4,7-epoxyisobenzofuran-1-ol and hexa- and octahydro-5,8-epoxy-1H-2-benzopyran-3-ol. 4,220,594, Cl. 260-345.900.
Spray Plast S.r.l: *See—*
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Sprecher & Shuh AG: *See*—
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.
Sprott, Charles N.; and Yates, Leonard S., to International Business Machines Corporation. Apparatus for producing preliminary character printout of text and instruction codes of word processing apparatus. 4,220,417, Cl. 400-70.000.
Sqourakes, George E., to Foxboro Company, The. Flowmetering apparatus. 4,220,046, Cl. 73-861.220.
Staab, Joachim; Apel, Willy; and Wolf, Heinz, to Hartmann & Braun Aktiengesellschaft. Construction for photometric analyzer. 4,220,415, Cl. 356-433.000.
Staffolani, Nicola, to Pantomedical Grifo S.A.S.; and Nicola Staffolani. Dental implant and method of inserting. 4,220,712, Cl. 433-173.000.
Stager, Francis W., to Litton Industrial Products, Inc. Fire safe butterfly valve. 4,220,172, Cl. 137-74.000.
Stahle, Helmut: *See*—
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; and Muacevic, Gojko, 4,220,659, Cl. 424-309.000.
Stamicarbon, B.V.: *See*—
Steeman, Johannes W. M., 4,220,203, Cl. 166-271.000.
Stamp, Roger A.; and Williams, Farrell D. Hydrotherapy apparatus. 4,220,145, Cl. 128-66.000.
Standard Oil Company: *See*—
Schott, Jeffrey H.; Palmer, David A.; and Schroeder, Hobe, 4,220,596, Cl. 260-346.700.
Standard Oil Company (Indiana): *See*—
Allen, Neil W., 4,220,207, Cl. 166-367.000.
Cerefice, Steven A.; and Paschke, Edward E., 4,220,753, Cl. 528-302.000.
Puskas, Imre; and Fields, Ellis K., 4,220,746, Cl. 526-265.000.
Stanford, Arthur, to AMF Incorporated. Hamburger buns and method of preparing same. 4,220,065, Cl. 83-873.000.
Stanley Tools Limited: *See*—
Scott, David B., 4,219,915, Cl. 29-78.000.
Stanley Works, The: *See*—
Catlett, John C., 4,220,051, Cl. 74-89.150.
Stapp, Paul R., to Phillips Petroleum Company. Oxidative rearrangement of olefins. 4,220,604, Cl. 568-401.000.
Stapp, Paul R., to Phillips Petroleum Company. Oxidative esterification process. 4,220,800, Cl. 560-246.000.
Star Packaging Corporation: *See*—
Andrews, H. David, 4,219,989, Cl. 53-572.000.
Stark, Sheldon L., to Caterpillar Tractor Co. A-frame for carrying loads on a loader. 4,220,215, Cl. 180-6.700.
Staudenmaier, Hans J.: *See*—
James, William L.; and Staudenmaier, Hans J., 4,220,445, Cl. 432-250.000.
Stauffer Chemical Company: *See*—
Felix, Raymond A., 4,220,656, Cl. 424-274.000.
Stearns & Foster Company, The: *See*—
Henning, John C., 4,219,911, Cl. 28-103.000.
Steelastic Company, The: *See*—
Kiemer, Ralph F.; and Baugher, Robert C., 4,220,063, Cl. 83-635.000.
Steeman, Johannes W. M., to Stamicarbon, B.V. Method for recovering coal in situ. 4,220,203, Cl. 166-271.000.
Stefanchik, John A., to Union Carbide Corporation. Process for the determination of serum inorganic phosphate. 4,220,451, Cl. 23-230.00B.
Stein, Klaus: *See*—
Richter, Gerhard; and Stein, Klaus, 4,220,231, Cl. 192-82.00T.
Steinhofel, Horst: *See*—
Serbent, Harry; Eichberger, Heinz; Lommert, Hermann; Lausch, Herbert; and Steinhofel, Horst, 4,220,631, Cl. 423-175.000.
Steinwart, Johannes; and Bauder, Armin, to Audi NSU Auto Union Aktiengesellschaft. Fuel injection system. 4,220,129, Cl. 123-457.000.
Stemme, Otto; Lermann, Peter; Wagner, Karl; and Engelsmann, Dieter, to AGFA-Gevaert A.G. Camera setting device. 4,220,405, Cl. 354-21.000.
Stemme, Otto; Wagner, Karl; Lermann, Peter; Schroder, Rolf; and Utschig, Peter, to AGFA-Gevaert A.G. Camera with film transport motor powered by battery which also charges a flash unit during intervals of transport motor inoperativeness. 4,220,407, Cl. 354-126.000.
Stephenson, William I., Jr.: *See*—
Wafer, John A.; Hill, Robert H.; and Stephenson, William I., Jr., 4,220,934, Cl. 335-16.000.
Sterling Drug Inc.: *See*—
Bell, Malcolm R.; and Oesterlin, Rudolf, 4,220,763, Cl. 544-143.000.
Crounse, Nathan N.; and Schmidt, Paul J., 4,220,357, Cl. 282-27.500.
Sternbergh, James H., to TRW Inc. Carbon brush for motors and method of making the same. 4,220,884, Cl. 310-251.000.
Stevens, Albert: *See*—
McMullan, James P.; and Stevens, Albert, 4,220,848, Cl. 219-528.000.
Stewart, James L.; and Owers, Raymond G., to Ahi Operations Limited. Reinforcing struts for roofing tiles. 4,219,981, Cl. 52-478.000.
Stewart, Patrick H.: *See*—
Kho, Khe-Bing J.; and Stewart, Patrick H., 4,220,578, Cl. 260-31.80M.
Stiles, Palmer. Arch block building system. 4,219,961, Cl. 46-24.00R.
Stoldt, Clayton L., to GTE Products Corporation. Edge mounting device. 4,220,303, Cl. 248-205.00R.
Stoltefuss, Jurgen, to Bayer Aktiengesellschaft. Preparation of 1-desoxy-nojirimicin and N-substituted derivatives. 4,220,782, Cl. 546-242.000.
Storz, Werner; Wolpert, Siegfried; and Futterknecht, Kuno, to J. & J. Marquardt. Electrical switch construction. 4,220,835, Cl. 200-67.0DB.
Stowers, Kimball E.: *See*—
Braginetz, Paul A.; Powers, Grady M.; and Stowers, Kimball E., 4,219,935, Cl. 33-174.00R.
Streisel, John P., to Barber Manufacturing Company, The. Gas-fired radiant burner. 4,220,132, Cl. 126-271.20R.
Strien, Werner; Goldner, Walther; and Venieris, George J., to Recaro GmbH & Co. Console for a vehicle seat. 4,220,308, Cl. 248-424.000.
Striffler, Eugene, Jr.; and Kolakowski, Michael A., to N L Industries, Inc. Production of lead monoxide from lead sulfate with acidic ammonium acetate. 4,220,628, Cl. 423-92.000.
Strobel, Rudolf G. K., to Procter & Gamble Company, The. Low-temperature steam desorbate process for improved instant tea. 4,220,673, Cl. 426-655.000.
Stromberg-Carlson Corporation: *See*—
Littlefield, Bruce G., 4,220,823, Cl. 179-16.00F.
Stupay, Lawrence J.: *See*—
Biche, Barton A.; and Stupay, Lawrence J., 4,220,387, Cl. 339-61.00R.
Sturla, Robert A.: *See*—
Ichida, LeRoy F.; Sturla, Robert A.; and Sacks, Jacob M., 4,220,967, Cl. 358-105.000.
Sturmer, Ekkehard; and Einstein, Bernhard, to Lasag AG. Method of removing material from a workpiece. 4,220,842, Cl. 219-121.0LM.
Suami, Tetsuo. Nitrosourea pentose compounds. 4,220,643, Cl. 424-180.000.
Sugibuchi, Shigeyoshi; Hiramatsu, Mitsuo; and Aizawa, Takeo, to Sanritsu Denki Kabushikikaisha. Process for manufacturing a multi-colored display polarizer. 4,220,705, Cl. 430-294.000.
Sugimoto, Yoshihde: *See*—
Naka, Hiromitsu; Miyashiro, Takeshi; Kawase, Hidetoshi; Sugimoto, Yoshihde; Shirataki, Tsutomu; and Morishita, Hiroshi, 4,220,316, Cl. 256-59.000.
Sugishita, Nobuyuki: *See*—
Abe, Katsuo; Taguchi, Noriyuki; Sugishita, Nobuyuki; and Isogai, Tokio, 4,220,547, Cl. 252-63.500.
Suito, Senji: *See*—
Kasahara, Takahiko; Shichi, Shigeharu; and Suito, Senji, 4,220,103, Cl. 112-260.000.
Sullaway, Bob L., to Halliburton Company. Leg closure. 4,220,422, Cl. 405-225.000.
Sulzer Brothers Limited: *See*—
Weber, Max, 4,220,200, Cl. 165-142.000.
Sumitomo Bakelite Company Limited: *See*—
Noguchi, Yasuo; Kokuzawa, Taro; Suzuki, Hideyuki; and Yokose, Toru, 4,220,040, Cl. 73-24.000.
Sumitomo Chemical Company, Limited: *See*—
Kagawa, Keiji; Kanda, Naoya; Masuko, Fujio; and Nakanishi, Hirotoshi, 4,220,592, Cl. 260-340.50R.
Miki, Tamotsu; Narisawa, Shizuo; Horiike, Hideki; and Ichikawa, Ichiro, 4,220,738, Cl. 525-242.000.
Sumitomo Durez Company, Ltd.: *See*—
Tomita, Shoji; and Tokunaga, Tetsuya, 4,220,441, Cl. 425-6.000.
Sumitomo Electric Industries, Ltd.: *See*—
Kotani, Yasutoyo; Sawada, Kazuo; Nagai, Shuzo; Ogino, Takao; and Watabe, Seiji, 4,220,508, Cl. 204-129.650.
Sun Chemical Corporation: *See*—
Huffner, Stanley F.; and Smith, Hugh M., 4,220,479, Cl. 106-288.00Q.
Robertson, George H., 4,220,473, Cl. 106-23.000.
Silverman, Stanley, 4,220,865, Cl. 250-504.00R.
Sun Ventures, Inc.: *See*—
Dickason, Alan F.; and Cherry, Wesley R., 4,220,595, Cl. 260-346.750.
Suntech, Inc.: *See*—
Bleiman, Arnold M.; and Russell, Gordon A., 4,220,481, Cl. 134-6.000.
Moore, Robert E., 4,220,606, Cl. 260-648.00F.
Superior Electric Company, The: *See*—
Leenhouts, Albert C.; and Singh, Gurdial, 4,220,904, Cl. 318-696.000.
Superior Electric Supply Co.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,220,440, Cl. 417-12.000.
Superior Switchboard & Devices Division of The Union Metal Manufacturing Co.: *See*—
Foster, Joseph J., Jr.; and Schneider, Walter C., 4,220,363, Cl. 292-164.000.
Supik, Helmuth, to Schmalbach-Lubeca GmbH. Process and apparatus for annealing can bodies. 4,220,106, Cl. 113-120.00Y.
Surdi, Jean M.: *See*—
Dubois, Claude; and Surdi, Jean M., 4,220,055, Cl. 74-573.00R.
Sutphin, Howard D.: *See*—
Lieber, Albert J.; and Sutphin, Howard D., 4,220,975, Cl. 358-209.000.
Suzuki, Hideyuki: *See*—
Noguchi, Yasuo; Kokuzawa, Taro; Suzuki, Hideyuki; and Yokose, Toru, 4,220,040, Cl. 73-24.000.
Suzuki Iron Works Co., Ltd.: *See*—
Suzuki, Masakazu, 4,220,428, Cl. 407-105.000.
Suzuki, Masakazu, to Suzuki Iron Works Co., Ltd. Tool holder. 4,220,428, Cl. 407-105.000.

Suzuki, Masatoshi: *See*—
Niwa, Hitoshi; Miwa, Naoto; Suzuki, Masatoshi; and Ouki, Masami, 4,220,517, Cl. 204-195.00S.
Sano, Hiromi; and Suzuki, Masatoshi, 4,220,516, Cl. 204-195.00S.

Suzuki, Mikio: *See*—
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.

Suzuki, Satomi: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,220,059, Cl. 74-865.000.

Suzuki, Shigeyoshi: *See*—
Tsubai, Yasuo; and Suzuki, Shigeyoshi, 4,220,702, Cl. 430-204.000.

Suzuki, Shoji: *See*—
Chiba, Yasutsune; Arima, Shizuo; Suzuki, Shoji; and Saitoh, Masayuki, 4,220,910, Cl. 323-19.000.

Suzuki, Suzuo; Maruoka, Hiroyuki; Nagaishi, Hatsuo; and Matsubara, Yuji, to Nissan Motor Company, Limited. Mass flow measuring apparatus. 4,220,045, Cl. 73-861.050.

Sweat, C. Downing, Jr.: *See*—
Hebert, Chris J.; Hollister, Ralph T.; and Sweat, C. Downing, Jr., 4,220,170, Cl. 134-167.00R.

Swiss Aluminium Ltd.: *See*—
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, 4,220,843, Cl. 219-121.00P.

Swithenbank, Colin: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 4,220,468, Cl. 71-124.000.

Sybertz, Hans, to Hombak Maschinenfabrik KG. Arrangement for mounting a cutting blade, particularly on a rotor of a wood-chipping machine. 4,220,186, Cl. 144-230.000.

Symmons, Edgar B.: *See*—
Taumann, Leonhard; and Symmons, Edgar B., 4,220,866, Cl. 250-513.000.

Systron-Donner Corporation: *See*—
Bright, Clark I., 4,220,857, Cl. 250-339.000.

Syva Company: *See*—
Maggio, Edward T., 4,220,450, Cl. 23-230.00B.
Rowley, Gerald L.; Leung, Danton; and Singh, Prithiphal, 4,220,722, Cl. 435-188.000.

Szadkowski, Stanislav, to Vesuvius International Corporation. Flow control device for molten metal. 4,220,270, Cl. 222-600.000.

Szadkowski, Stanislav, to Vesuvius International Corporation. Device for replacing pouring tubes. 4,220,271, Cl. 222-607.000.

Taguchi, Noriyuki: *See*—
Abe, Katsuo; Taguchi, Noriyuki; Sugishita, Nobuyuki; and Isogai, Tokio, 4,220,547, Cl. 252-63.500.

Taisan Industrial Co., Ltd.: *See*—
Chiba, Yasutsune; Arima, Shizuo; Suzuki, Shoji; and Saitoh, Masayuki, 4,220,910, Cl. 323-19.000.

Tajima, Shinobu; and Ohta, Kazutoshi, to Mitsubishi Denki Kabushiki Kaisha. Wire rope. 4,219,995, Cl. 57-220.000.

Takahashi, Mitsuo: *See*—
Takahashi, Rissburo; and Takahashi, Mitsuo, 4,220,537, Cl. 210-333.00R.

Takahashi, Risaburo; and Takahashi, Mitsuo, to Seicho Machinary Co., Ltd. Drum type disc filter device for paper pulp slurry. 4,220,537, Cl. 210-333.00R.

Takahashi, Seiichi: *See*—
Iwata, Yutaka; Takahashi, Seiichi; and Kaminishi, Katsuzo, 4,220,874, Cl. 307-256.000.

Takahashi, Shigeo: *See*—
Mizuno, Kiyofumi; Maeda, Hiroaki; Takahashi, Shigeo; Sato, Masanori; and Suzuki, Satomi, 4,220,059, Cl. 74-865.000.

Takano, Katsuyoshi: *See*—
Satomura, Hiroshi; and Takano, Katsuyoshi, 4,220,546, Cl. 252-62.900.

Takashima, Hiroaki: *See*—
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, 4,220,474, Cl. 106-44.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, 4,220,761, Cl. 544-27.000.

Takaya, Takao; Masugi, Takashi; Takasugi, Hisashi; and Kochi, Hiromu, to Fujisawa Pharmaceutical Co., Ltd. 7-[Substituted oximinoacetamido]-3-[hydroxy alkyltetrazolo]cephalosporin derivatives. 4,220,761, Cl. 544-27.000.

Takenaka, Toichi: *See*—
Kojima, Tadao; and Takenaka, Toichi, 4,220,649, Cl. 424-266.000.

Takeuchi, Tohru, to Nissan Motor Company, Limited. Method of and system for controllably connecting load to generator. 4,220,868, Cl. 290-7.000.

Talbot, Daniel B.; and Blackmer, David E., to DBX, Inc. Signal expander. 4,220,929, Cl. 330-136.000.

Talmage, John E., Jr.: *See*—
Gibson, William A.; and Talmage, John E., Jr., 4,220,815, Cl. 178-18.000.

Tamura, Junichi: *See*—
Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, 4,220,670, Cl. 426-287.000.

Tanaka, Makoto; and Matsudaira, Takayuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Position control method and apparatus for controlling the position of the wire discharging port of a laying head. 4,220,026, Cl. 72-15.000.

Tanaka, Susumu; and Konishi, Katsutoshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic plate with multiple layers. 4,220,696, Cl. 430-59.000.

Tanaka, Takao; Asanuma, Tadashi; Shiomura, Tetsunosuke; and Ito, Akira, to Mitsui Toatsu Chemicals, Inc. Process for polymerization of α-olefins. 4,220,745, Cl. 526-125.000.

Tanaka, Yutaka: *See*—
Kosugi, Takumi; Yasunaga, Shigeki; Tanaka, Yutaka; and Hashimoto, Yoshihiko, 4,220,734, Cl. 525-85.000.

Tanczyn, Harry: *See*—
Schumacher, William J.; and Tanczyn, Harry, 4,220,689, Cl. 428-558.000.

Taniguchi, Yasuyoshi: *See*—
Uetani, Yoshio; Taniguchi, Yasuyoshi; Yokoyama, Kenichi; and Matsushima, Seiichi, 4,220,694, Cl. 429-172.000.

Tanimoto, Tsutomu; Nagasawa, Mutsuo; and Kashiwakura, Junji, to Japan Synthetic Rubber Co., Ltd. High-hardness and high-modulus rubber composition containing 1,2-polybutadiene. 4,220,564, Cl. 260-5.000.

Taoka, Akira; and Uchida, Seiichi, to Bio Research Center Co., Ltd. Manufacture of fatty acids having straight and long carbon chains using a microorganism. 4,220,720, Cl. 435-142.000.

Tappe, Horst, to Cassella Aktiengesellschaft. Substituted pyridines and process for making them. 4,220,784, Cl. 546-296.000.

Tardy, Andre, to Societe Anonyme dite: Compagnie Generale d'Electricite. Optical fibre connector. 4,220,394, Cl. 350-96.210.

Targowski, Roger W.; and Fisher, Chester G., III, to Perkin-Elmer Corporation, The. Automatic gas flow control apparatus for an atomic absorption spectrometer burner. 4,220,413, Cl. 356-315.000.

Tarli, Paolo: *See*—
Meiattini, Franco; Giannini, Giuliano; and Tarli, Paolo, 4,220,714, Cl. 435-17.000.

Tarum, Arden V.; and Scherbel, Gordon H., to FMC Corporation. Method of opening tapholes in a phosphorus furnace. 4,220,317, Cl. 266-45.000.

Tatard, Francois, to Societe d'Investissement pour le Developpement des Appareils Menagers. Products based on plaster and processes for their manufacture. 4,220,576, Cl. 260-29.40R.

Tates, Donald W.; and Nobles, Gary A., to Xerox Corporation. Sorting apparatus. 4,220,325, Cl. 271-293.000.

Taumann, Leonhard; and Symmons, Edgar B., to Siemens Aktiengesellschaft. Electron applicator. 4,220,866, Cl. 250-513.000.

Taylor, Julian S. Fluid temperature compensator circuit for a thermal gauge probe. 4,220,039, Cl. 73-15.00R.

Taylor, Noel R.; and Taylor, Paul A., to Superior Electric Supply Co. Automatic load seeking control for a pumpjack motor. 4,220,440, Cl. 417-12.000.

Taylor, Paul A.: *See*—
Taylor, Noel R.; and Taylor, Paul A., 4,220,440, Cl. 417-12.000.

TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See*—
Scholz, Werner, 4,220,968, Cl. 358-127.000.

Teijin Limited: *See*—
Hara, Shigeyoshi; and Yamada, Takeyoshi, 4,220,563, Cl. 260-2.300.

Teletype Corporation: *See*—
Heeren, Richard H., 4,219,925, Cl. 29-578.000.
Heeren, Richard H., 4,221,001, Cl. 365-78.000.

Telina, Larisa A.: *See*—
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Tendeloo, Kees: *See*—
Barten, Piet G. J.; Gerritsen, Jan; and Tendeloo, Kees, 4,220,897, Cl. 315-368.000.

Tenna Corporation: *See*—
Nagel, Martin J., 4,220,832, Cl. 179-115.5PS.

Tenneco Chemicals, Inc.: *See*—
Feldman, Martin L., 4,220,754, Cl. 528-483.000.

Terada, Haruyoshi: *See*—
Matsushima, Yasunobu; Oda, Nobuyuki; and Terada, Haruyoshi, 4,220,486, Cl. 148-6.15R.

Terasaki Denki Sangyo Kabushiki Kaisha: *See*—
Kawai, Ituo; and Maeda, Hisaharu, 4,220,822, Cl. 370-83.000.

Ternovoi, Anatoly I.: *See*—
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Terra, Luigi: *See*—
Colombo, Sergio; and Terra, Luigi, 4,220,861, Cl. 250-363.00S.

Tesch, Allen R.; and Tesch, Scott T. Solar energy collecting system. 4,220,137, Cl. 126-425.000.

Tesch, Scott T.: *See*—
Tesch, Allen R.; and Tesch, Scott T., 4,220,137, Cl. 126-425.000.

Tetra Pak Developpement SA: *See*—
Nilsson, Erling I., 4,220,249, Cl. 215-237.000.

Texaco Inc.: *See*—
Hughes, James W.; Kudchadker, Mohan V.; and Dunn, Nancy G., 4,220,204, Cl. 166-274.000.
Jahnke, Frederick C.; MacLean, John P.; Williams, Dale; and Brown, John D., 4,220,623, Cl. 422-144.000.
Pogonowski, Ivo C., 4,220,034, Cl. 72-399.000.
Whatley, Houston A., Jr., 4,220,851, Cl. 250-252.000.

Texacone Company, The: *See—*
Wheeler, John H., 4,220,674, Cl. 427-11.000.

Textima Veb Wirkmaschinenbau: *See—*
Schubert, Frank; and Schneider, Manfred, 4,220,274, Cl. 226-34.000.

Thacker, Fred E.; and Noteboom, Verdell. Animal stunning gun. 4,219,905, Cl. 17-1.00B.

Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, to Sprecher & Shuh AG. Gas-blast switch. 4,220,838, Cl. 200-148.00A.

Thame, Neville G.: *See—*
Bock, Jan; Thame, Neville G.; and Westerman, Lowell, 4,220,573, Cl. 260-23.50A.

Thea (Therapeutique et Applications) SA: *See—*
Chibret, Henri, 4,220,645, Cl. 424-248.580.

Therm-Air Industries, Inc.: *See—*
Livezey, David J., 4,220,131, Cl. 126-121.000.

Thomas & Betts Corporation: *See—*
Kuo, Ted L. C., 4,219,928, Cl. 29-868.000.

Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Hinge structure. 4,220,253, Cl. 220-338.000.

Thomas, Thomas R.: *See—*
Pence, Dallas T.; and Thomas, Thomas R., 4,220,632, Cl. 423-239.000.

Thompson, Bruce R., to United Packages Limited. Variable volume flushing cistern. 4,219,895, Cl. 4-325.000.

Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; and Thompson, Neil E. S., 4,220,785, Cl. 546-349.000.

Thomson-CSF: *See—*
Abeille, Jean; Coeuillet, Jacques; Coutenceau, Francois; and Grandfils, Claude, 4,220,004, Cl. 60-413.000.
Carre, Roland, 4,220,953, Cl. 343-16.00M.
Duchemin, Jean-Pascal; Leguen, Daniel; Bonnet, Michel; Koelsch, Francois; and Beuchet, Gerard, 4,220,488, Cl. 148-175.000.

Thorne, Paul M., to FMC Corporation. Subsea wellhead protective enclosure. 4,220,421, Cl. 405-211.000.

Thyssen Aktiengesellschaft, vorm. August Thyssen-Hutte: *See—*
Beckers, Karl D.; Hees, Eckart; and Bauer, Gerhard, 4,220,269, Cl. 222-600.000.

Thyssen Industrie AG: *See—*
Meiser, Gerd; and Dillhofer, Heinz, 4,220,430, Cl. 409-231.000.

Tiedemann, Hugo: *See—*
Rittersdorf, Walter; Tiedemann, Hugo; Werner, Wolfgang; and Wielinger, Hans, 4,220,713, Cl. 435-14.000.

Tippmer, Kurt, to Carl Still, Firma. Method for producing reduction gases consisting essentially of carbon monoxide and hydrogen. 4,220,469, Cl. 75-91.000.

Tobin, Thomas J.: *See—*
Meister, Otto; and Tobin, Thomas J., 4,220,942, Cl. 337-277.000.

Toh, Tagao; and Iwaoka, Kazuo, to Matsushita Electric Industrial Co., Ltd. Exhaust gas control equipment. 4,220,625, Cl. 422-180.000.

Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M. Raw mix for producing Portland cement clinker. 4,220,475, Cl. 106-89.000.

Tokico Ltd.: *See—*
Karasudani, Yasuo, 4,220,224, Cl. 188-73.300.
Kato, Tetuo, 4,220,228, Cl. 188-319.000.
Kobayashi, Kinzo, 4,220,225, Cl. 188-73.600.

Toko, Inc.: *See—*
Satomura, Hiroshi; and Takano, Katsuyoshi, 4,220,546, Cl. 252-62.900.

Tokunaga, Tetsuya: *See—*
Tomita, Shoji; and Tokunaga, Tetsuya, 4,220,441, Cl. 425-6.000.

Tokyo Electric Co., Ltd.: *See—*
Hamano, Koichi; Morimoto, Takao; Watanabe, Junko; Ono, Kaoru; and Yagi, Norio, 4,220,991, Cl. 364-405.000.

Tokyo Print Industry Co., Ltd.: *See—*
Arai, Minoru; and Baba, Akio, 4,220,810, Cl. 174-68.500.

Tokyo Sanyo Electric Co., Ltd.: *See—*
Ikeguchi, Shigehiko, 4,220,922, Cl. 455-182.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Tanaka, Makoto; and Matsudaira, Takayuki, 4,220,026, Cl. 72-15.000.

Tolasch, Gerhard: *See—*
Blidung, Otto; and Tolasch, Gerhard, 4,220,236, Cl. 198-347.000.

Tolliday, Ian D.: *See—*
Spadini, Gianfranco L.; Tolliday, Ian D.; and McRitchie, Allan C., 4,220,562, Cl. 252-542.000.

Tominaga, Tetsuhiko: *See—*
Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, 4,220,670, Cl. 426-287.000.

Tominaga, Yoshiharu: *See—*
Baba, Kazushi; Miura, Hisashi; and Tominaga, Yoshiharu, 4,220,025, Cl. 72-8.000.

Tomita, Kazuo; and Habu, Nobuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control device for an internal combustion engine. 4,220,126, Cl. 123-411.000.

Tomita, Shoji; and Tokunaga, Tetsuya, to Sumitomo Durez Company, Ltd. Apparatus for making prills from melted substance. 4,220,441, Cl. 425-6.000.

Tommeraas, Nils C.; and Legernes, Kolbjorn, to A/S Raufoss Ammunisjonsfabrikker. Method and means for gauging of threads. 4,219,938, Cl. 33-199.00R.

Tomuro, Jinichi: *See—*
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, 4,220,518, Cl. 208-48.00R.

Tonnessen, Arne, to Moss Rosenberg Verft a.s. Insulated tanks for liquefied gases. 4,220,255, Cl. 220-445.000.

Topsil A/S: *See—*
De Leon, Noel, 4,220,839, Cl. 219-10.49R.

Toray Industries, Inc.: *See—*
Edgawa, Hiroshi; Fujita, Toshinori; and Uesugi, Yasuo, 4,219,996, Cl. 57-225.000.

Torbett, Christopher J.: *See—*
Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,220,846, Cl. 219-381.000.

Torri, Aldo. Automatic dispenser for automatically dispensing lighted cigarettes. 4,220,256, Cl. 221-147.000.

Torrington, Leslie A.; and Huff, Larry D., to RCA Corporation. Constant drag carriage translating mechanism for video disc player. 4,220,340, Cl. 274-13.00R.

Toshiba Silicone Co., Ltd.: *See—*
Hashimoto, Mitsuyoshi; Hosokawa, Kiyoshi; and Murai, Bunjirou, 4,220,748, Cl. 528-18.000.

Toth Aluminum Corporation: *See—*
Wyndham, Ronald; Chaplin, Gervase M.; and Lippman, Alfred, 4,220,629, Cl. 423-76.000.

Totsugawa, Kunikazu: *See—*
Ohba, Kazunori; Nojiri, Chuhei; Ogawa, Yasuaki; Itoh, Jiro; Totsugawa, Kunikazu; Ezaki, Norio; Shomura, Takashi; Niwa, Tomizo; Inouye, Shigeharu; and Yamada, Yujiro, 4,220,639, Cl. 424-117.000.

Touborg, Jorn, to F. L. Smidth & Co. Cement kiln plants. 4,220,476, Cl. 106-100.000.

Towmotor Corporation: *See—*
Friesen, Larry D.; and Palmer, Stephen L., 4,220,050, Cl. 74-2.000.

Townsend Engineering Company: *See—*
Townsend, Ray T., 4,220,669, Cl. 426-281.000.

Townsend, Ray T., to Townsend Engineering Company. Method and means for injecting fluids into meat products. 4,220,669, Cl. 426-281.000.

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Mohri, Zenichi; Tominaga, Tetsuhiko; Tamura, Junichi; and Otsuka, Shigeru, 4,220,670, Cl. 426-287.000.

Toyobo Co., Ltd.: *See—*
Etoh, Kuniomi; and Nanpei, Masaru, 4,220,704, Cl. 430-281.000.

Toyoda Koki Kabushiki Kaisha: *See—*
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.

Toyomoto, Kazuo: *See—*
Ohmura, Kaoru; Sasaguri, Kiichiro; and Toyomoto, Kazuo, 4,220,707, Cl. 430-325.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ban, Hiroshi; Hori, Hideichi; Kudo, Ryoichi; and Yoshida, Akio, 4,220,233, Cl. 192-106.200.
Kondo, Takeo; and Inuzuka, Yutaka, 4,220,418, Cl. 403-76.000.
Numazawa, Akio; Kawabata, Minoru; Abe, Ryutaro; Suzuki, Mikio; and Inaguma, Yoshiharu, 4,220,072, Cl. 91-375.00A.
Sakai, Yukio; and Iida, Teiji, 4,219,968, Cl. 49-40.000.
Tomita, Kazuo; and Habu, Nobuo, 4,220,126, Cl. 123-411.000.
Yasui, Toshio; Naito, Motoharu; and Asami, Ken, 4,220,871, Cl. 307-10.00R.

Traben, Josef, to Gebruder Linck Maschinenfabrik und Eisen/Giesserel Gatterlinck, Firma. Apparatus for producing machined timber. 4,220,185, Cl. 144-3.00P.

Traber, Rene P.; Kuhn, Max; Hofmann, Hans; and Hari, Eugen, to Sandoz Ltd. Organic compounds. 4,220,641, Cl. 424-177.000.

Trame, Charles E., to Everbrite Electric Signs. Inc. Non-electronic character display. 4,220,948, Cl. 340-378.200.

Trane Company, The: *See—*
Bergman, Mark O.; Leary, John W.; Sanborn, Duane F.; and Ware, Chester D., 4,220,011, Cl. 62-185.000.

Trecker, David J.: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,220,569, Cl. 260-23.0EP.

Trethewy, Brian R.: *See—*
Hametner, Albert L.; Merrell, Hollis B.; and Trethewy, Brian R., 4,220,275, Cl. 227-5.000.

Trezeciak, Kurt H.: *See—*
Crase, Gary M.; Trezeciak, Kurt H.; and Tschirky, John E., 4,220,380, Cl. 308-174.000.

Trimborn, Werner: *See—*
Petersen, Harro; Fischer, Kurt; Klug, Hans; and Trimborn, Werner, 4,220,751, Cl. 528-232.000.

Tronconi, Giovanni: *See—*
Scolastico, Carol; and Tronconi, Giovanni, 4,220,798, Cl. 560-121.000.

Trott, Clarence R.; Veldhoven, Gerardus A.; and Chadwick, Dennis P., to Deere & Company. Manure spreader. 4,220,280, Cl. 239-1.000.

Trudell, William R. Lifter for valve-boxes. 4,220,366, Cl. 294-104.000.

True Temper Corporation: *See—*
Cosmos, Pete, 4,219,993, Cl. 56-400.170.

Truher, Michael B.; and Truher, Sheryl L. Illumination device for a waterbed. 4,220,984, Cl. 362-130.000.

Truher, Sheryl L.: *See—*
Truher, Michael B.; and Truher, Sheryl L., 4,220,984, Cl. 362-130.000.

Trumpf Maschinen AG: *See—*
Blanz, Karl, 4,220,062, Cl. 83-71.000.
TRW Inc.: *See—*
Powers, Thomas R.; and Clark, Ricky L., 4,220,429, Cl. 408-224.000.
Sternbergh, James H., 4,220,884, Cl. 310-251.000.
Wesson, Laurence N.; and Durkow, Carl J., 4,220,943, Cl. 338-42.000.
Tschannen, Christian: *See—*
Thaler, Richard; Montigel, John; Meier, Hans-Ulrich; Jungo, Moritz; Tschannen, Christian; and Morva, Tibor, 4,220,838, Cl. 200-148.00A.
Tschirky, John E.: *See—*
Crase, Gary M.; Trezeciak, Kurt H.; and Tschirky, John E., 4,220,380, Cl. 308-174.000.
Tsubai, Yasuo; and Suzuki, Shigeyoshi, to Mitsubishi Paper Mills, Ltd. Method for making a lithographic printing plate. 4,220,702, Cl. 430-204.000.
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, to Shionogi & Co., Ltd. Oxazolines. 4,220,766, Cl. 544-182.000.
Tsukiji, Yoshihiro, to Kabushiki Kaisha Komatsu Seisakusho. Turning-tool mounting on a machine tool. 4,220,061, Cl. 82-36.00R.
Tsuru, Yoshiyuki: *See—*
Fukutomi, Naoki; Tsuru, Yoshiyuki; Kawaguchi, Kunio; and Naoyuki, Susumu, 4,219,927, Cl. 29-850.000.
Tsuruta, Masao: *See—*
Mizutani, Shigemitsu; Tsuruta, Masao; Matsumoto, Yasuo; and Ono, Kengo, 4,220,292, Cl. 242-71.800.
Tulacs, Laszlo; and Hiden, Hans, to Vianova Kunstharz, A.G. Mass polymerization process. 4,220,744, Cl. 526-86.000.
Turen, Christer. Method and device for surveying the basal area of a forest stand. 4,219,939, Cl. 33-275.00R.
Turner, Dennis R.: *See—*
Skurkiss, Peter K.; and Turner, Dennis R., 4,220,506, Cl. 204-28.000.
Tuzson, John J.: *See—*
Bearden, John L.; Gopalakrishnan, Sankaraiyer; and Tuzson, John J., 4,219,917, Cl. 29-156.40R.
Uchida, Hiromichi. Device for transferring an adhesive film from a transferring adhesive tape roll to an article. 4,220,495, Cl. 156-577.000.
Uchida, Isamu; Watanabe, Kenkichi; and Miyazaki, Yorizo, to Laurel Bank Machine Co., Ltd.; and Laurel Bank Machine Co., Ltd. Coin packaging machine. 4,219,985, Cl. 53-212.000.
Uchida, Kinya: *See—*
Aida, Ko; Uchida, Kinya; Kawada, Izumi; and Ito, Hideichi, 4,220,719, Cl. 435-133.000.
Uchida, Seiichi; Satomi, Yoshihito; Kiuchi, Norihiro; Yamagata, Takeo; Yoshioka, Susumu; Miyamoto, Tomohiko; and Tomuro, Jinichi, to Hitachi, Ltd.; and Nippon Mining Co., Ltd. Method for preventing coking in fluidized bed reactor for cracking heavy hydrocarbon oil. 4,220,518, Cl. 208-48.00R.
Uchida, Seiichi: *See—*
Taoka, Akira; and Uchida, Seiichi, 4,220,720, Cl. 435-142.000.
Uchida, Shinzi; Yokoyama, Takashi; and Ohkubo, Shoichi, to Mitsubishi Chemical Industries, Limited. Flame-retardant isocyanate-based foams and method of producing the same. 4,220,729, Cl. 521-124.000.
Uchino, Hideo: *See—*
Kamaike, Hiroshi; and Uchino, Hideo, 4,220,222, Cl. 187-29.00R.
Udaka, Shigezo; and Shoda, Makoto, to Nagoya University, President of. Method of cleaning phosphorus-containing waste water by microorganisms. 4,220,527, Cl. 210-12.000.
Udaltsov, Vladimir F.: *See—*
Shtanko, Vladlen M.; Karyazin, Pavel P.; Sirotkin, Sergei N.; Perimov, Jury A.; Udaltsov, Vladimir F.; Shut, Nina A.; and Khukhareva, Natalya N., 4,220,509, Cl. 204-129.950.
Uemura, Seiichi; Yamamoto, Syunichi; Hirose, Takao; Takashima, Hiroaki; Kato, Osamu; and Nagai, Minoru, to Nippon Oil Co., Ltd.; and Shinagawa Refractories Co., Ltd. Amorphous refractory compositions. 4,220,474, Cl. 106-44.000.
Uenoyama, Masaru: *See—*
Umeda, Haruhiko; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Endo, Naotaka, 4,220,352, Cl. 280-708.000.
Uesugi, Yasuo: *See—*
Edgawa, Hiroshi; Fujita, Toshinori; and Uesugi, Yasuo, 4,219,996, Cl. 57-225.000.
Uetani, Yoshio; Taniguchi, Yasuyoshi; Yokoyama, Kenichi; and Matsushima, Seiichi, to Hitachi Maxell, Ltd. Leak-proof alkaline cell and its production. 4,220,694, Cl. 429-172.000.
Uetani, Yoshio: *See—*
Ishida, Osamu; Uetani, Yoshio; and Matsushima, Seiichi, 4,220,695, Cl. 429-172.000.
Uhlig, Albert R.; and Krall, Thomas J., to Owens-Illinois, Inc. Safety closure. 4,220,262, Cl. 222-153.000.
Ulisch, Gunter: *See—*
Kindervater, Friedrich; Ulisch, Gunter; Bohmann, Theodor; Mengel, Manfred; and Puppe, Lothar, 4,220,567, Cl. 260-22.00A.
Ulmer, William E.: *See—*
Clark, Scott A.; and Ulmer, William E., 4,220,950, Cl. 340-594.000.
Umeda, Haruhiko; Uenoyama, Masaru; Ishizuki, Kotoshige; Ando, Hiroyuki; and Endo, Naotaka, to Kabushiki Kaisha Komatsu Seisakusho. Suspension for a front axle of a trailer. 4,220,352, Cl. 280-708.000.
Union Carbide Australia Limited: *See—*
Wong, Chung-Chee; and Dalton, David R., 4,220,304, Cl. 248-231.000.
Union Carbide Corporation: *See—*
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,220,569, Cl. 260-23.0EP.
Godlewski, Robert E., 4,220,727, Cl. 521-110.000.
Marcinkowsky, Arthur E.; and Henry, Joseph P., 4,220,803, Cl. 562-538.000.
Stefanchik, John A., 4,220,451, Cl. 23-230.00B.
Union Oil Company of California: *See—*
Jackson, Hugh R., deceased; and Haas, Robert H., 4,220,120, Cl. 123-3.000.
Mickelson, Grant A., 4,220,557, Cl. 252-441.000.
Uniroyal, Inc.: *See—*
Rinehart, Robert E., 4,220,579, Cl. 260-33.6AQ.
United Packages Limited: *See—*
Thompson, Bruce R., 4,219,895, Cl. 4-325.000.
United States of America
Agriculture: *See—*
Dale, Jim E., 4,219,964, Cl. 47-1.500.
Air Force: *See—*
Bridges, Thomas N., 4,219,936, Cl. 33-174.00Q.
Kuhn, Ralph F., Jr., 4,220,933, Cl. 331-94.50D.
Reinhardt, Bruce A.; and Arnold, Fred E., 4,220,750, Cl. 528-172.000.
America: *See—*
Knazek, Richard A.; and Gullino, Pietro M., 4,220,725, Cl. 435-285.000.
Army: *See—*
Harmon, Darell B., Jr.; and Foss, Arnold W., 4,220,297, Cl. 244-3.210.
Israels, Sylvan H.; and Kosonocky, Stephan, 4,220,091, Cl. 102-64.000.
Smith, Robert C.; and Webb, John H., 4,220,092, Cl. 102-92.700.
Smith, William G., 4,220,089, Cl. 102-38.00R.
Wert, Harry E.; and Branham, Richard A., 4,220,833, Cl. 179-175.31R.
Energy: *See—*
Fisher, Gerald L.; and Bradley, Edward W., 4,220,856, Cl. 250-337.000.
Pence, Dallas T.; and Thomas, Thomas R., 4,220,632, Cl. 423-239.000.
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Hitchcock, Charles J., 4,220,552, Cl. 252-316.000.
Interior: *See—*
Paice, Derek A., 4,220,896, Cl. 315-205.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Bloch, Joseph T.; Hanger, Randolph T.; and Nichols, Frank W. Method and apparatus for fabricating improved solar cell modules. 4,219,926, Cl. 29-832.000.
La Flame, David T. Pseudonoise code tracking loop. 4,221,005, Cl. 375-1.000.
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Ruehr, William C.; Younghans, James L.; and Smith, Edwin B., 4,220,171, Cl. 137-15.100.
Navy: *See—*
Borgoyn, Milton J.; and Mitchell, Archer S., 4,220,195, Cl. 165-1.000.
Cowen, Steven J., 4,220,411, Cl. 356-73.100.
Nielsen, Arnold T.; and Bedford, Clifford D., 4,220,804, Cl. 568-584.000.
Whiteley, Thomas B.; and Adrian, Donald J., 4,220,952, Cl. 343-7.0PF.
U.S. Philips Corporation: *See—*
Barten, Piet G. J.; Gerritsen, Jan; and Tendeloo, Kees, 4,220,897, Cl. 315-368.000.
Beekmans, Antonius A. G., 4,220,890, Cl. 313-240.000.
Essers, Wilhelmus G., 4,220,844, Cl. 219-121.00P.
Gawron, Klaus; Mahdjuri, Faramarz; and Schroder, Johann, 4,220,196, Cl. 165-11.00R.
United States Surgical Corporation: *See—*
Noiles, Douglas G., 4,219,893, Cl. 3-1.911.
University of Adelaide, The: *See—*
Mullett, Leslie F., 4,219,963, Cl. 47-1.00R.
University of Arkansas Foundation: *See—*
Emert, George H.; and Blotkamp, Paul J., 4,220,721, Cl. 435-165.000.
University of California, Regents of: *See—*
Wang, Shyh; Shah, Manhar L.; and Crow, John D., 4,220,395, Cl. 350-96.120.
UOP Inc.: *See—*
Antos, George J., 4,220,521, Cl. 208-139.000.
Antos, George J., 4,220,558, Cl. 252-441.000.
Imai, Tamotsu, 4,220,764, Cl. 544-178.000.
Mikulicz, Michael Z.; and Himes, James F., 4,220,806, Cl. 585-716.000.
Upjohn Company, The: *See—*
Bundy, Gordon L., 4,220,796, Cl. 560-121.000.
Bundy, Gordon L., 4,220,797, Cl. 560-121.000.
Sih, John C., 4,220,758, Cl. 542-426.000.
Youngdale, Gilbert A., 4,220,648, Cl. 424-266.000.
Uram, Robert, to Westinghouse Electric Corp. Digital computer system and method for operating a steam turbine with efficient control mode selection. 4,220,869, Cl. 290-40.00R.

USM Corporation: *See*—
Powderley, John, 4,220,033, Cl. 72-391.000.
Usui, Hideo; Ishige, Sadao; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Recording materials containing chromenoindoles. 4,220,356, Cl. 282-27.500.
Utne, Torleif: *See*—
Rasmusson, Gary H.; Johnston, David B. R.; Reinhold, Donald F.; Utne, Torleif; and Jobson, Ronald B., 4,220,775, Cl. 546-77.000.
Utschig, Peter: *See*—
Stemme, Otto; Wagner, Karl; Lermann, Peter; Schroder, Rolf; and Utschig, Peter, 4,220,407, Cl. 354-126.000.
Utz, Eberhard; Fehrenbach, Siegfried; Klett, Dittmar; Bertsch, Richard; and Knapp, Heinrich, to Robert Bosch GmbH. Subpressure limiter for a fuel injection system. 4,220,123, Cl. 123-327.000.
Uyeo, Shoichiro: *See*—
Tsuji, Teruji; Yoshioka, Mitsuru; Uyeo, Shoichiro; Hamashima, Yoshio; Kikkawa, Ikuo; and Nagata, Wataru, 4,220,766, Cl. 544-182.000.
Vacilotto, Silvano. Vacuum hair trimmer. 4,219,931, Cl. 30-133.000.
Valmeta Oy: *See*—
Levanen, Kyosti, 4,220,502, Cl. 162-273.000.
van der Graaf, Gerardus C., to Shell Oil Company. Drill pipe telemetering system with electrodes exposed to mud. 4,220,381, Cl. 339-16.00C.
vander Sijpt, Gerardus F.: *See*—
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and vander Sijpt, Gerardus F., 4,220,463, Cl. 71-27.000.
van der Vies, Johannes, to Akzona Incorporated. Oral pharmaceutical preparation having androgenic activity. 4,220,599, Cl. 260-397.400.
Vanheiden, Peter: *See*—
Rohlfing, Wolfgang; and Vanheiden, Peter, 4,220,572, Cl. 260-45.95L.
Van Hijfte, Willy H. P.; Goethals, Rafael A. J.; Niks, Anton; and vander Sijpt, Gerardus F. Ammonium nitrate containing fertilizer bodies having improved properties during storage and transportation. 4,220,463, Cl. 71-27.000.
Vanlerberghe, Guy: *See*—
Kalopissis, Gregoire; and Vanlerberghe, Guy, 4,220,602, Cl. 260-570.700.
van Raalte, John A., to RCA Corporation. Phosphor screen for modular flat panel display device. 4,220,892, Cl. 313-422.000.
Van Winkle, Denzal W. Quick opening closure arrangement for well completions. 4,220,206, Cl. 166-318.000.
Vapor Corporation: *See*—
Reip, Raymond G., 4,220,074, Cl. 91-453.000.
Varitrac AG: *See*—
Horowitz, Alexandre, 4,220,096, Cl. 105-163.00R.
Varnin, Valentin P.: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.
VDO Adolf Schindling AG: *See*—
Pudelko, Heinz; and Kallweit, Gerhard, 4,220,944, Cl. 338-176.000.
Vegvari, Paul C.; Hess, William M.; and Chirico, Vincent E., to Columbian Chemicals Company. Measurement of carbon black dispersion. 4,220,042, Cl. 73-150.00R.
Veldhoven, Gerardus A.: *See*—
Trott, Clarence R.; Veldhoven, Gerardus A.; and Chadwick, Dennis P., 4,220,280, Cl. 239-1.000.
Venieris, George J.: *See*—
Strien, Werner; Goldner, Walther; and Venieris, George J., 4,220,308, Cl. 248-424.000.
Vesuvius International Corporation: *See*—
Szadkowski, Stanislav, 4,220,270, Cl. 222-600.000.
Szadkowski, Stanislav, 4,220,271, Cl. 222-607.000.
Vianova Kunstharz, A.G.: *See*—
Tulacs, Laszlo; and Hiden, Hans, 4,220,744, Cl. 526-86.000.
Victor Company of Japan, Limited: *See*—
Kitamura, Masatsugu; Onoye, Hideo; and Yamazaki, Masami, 4,220,979, Cl. 360-66.000.
Vigurs, John P. C., to IM Electronics Limited. Infra red radiation detector. 4,220,859, Cl. 250-353.000.
Villa, Enrico: *See*—
Draghiccio, Pietro; and Villa, Enrico, 4,220,102, Cl. 112-200.000.
Villers, Roger L.: *See*—
Mast, James W.; Martin, Virgil B.; and Villers, Roger L., 4,220,019, Cl. 64-28.00R.
Vineyard, Billy D.: *See*—
Knowles, William S.; Sabacky, Milton J.; and Vineyard, Billy D., 4,220,590, Cl. 260-326.14T.
Vinton, Clarence S.: *See*—
Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,220,846, Cl. 219-381.000.
Virginia Panel Corporation: *See*—
Braginetz, Paul A.; Powers, Grady M.; and Stowers, Kimball E., 4,219,935, Cl. 33-174.00R.
Vistan Corporation: *See*—
Margaroli, John L.; and Cimperman, Frederick J., 4,220,080, Cl. 99-494.000.
Vitat, Jean-Claude: *See*—
Cosnard, Jean-Claude; Sarafinof, Pierre; and Vitat, Jean-Claude, 4,220,448, Cl. 8-142.000.
Vivino, A. Earl. Administration of cimetidine to reduce appetite and facilitate weight loss in persons suffering from excessive weight. 4,220,653, Cl. 424-273.00R.
Vizenor, Richard P., to Honeywell Inc. Display apparatus with reflective separated structure. 4,220,400, Cl. 350-174.000.
Vnukov, Stanislav P.: *See*—
Fedoseev, Dmitry V.; Deryagin, Boris V.; Bakul, Valentin N.; Prikhna, Alexei I.; Gerasimenko, Valentin K.; Poltoratsky, Vladimir G.; Nikitin, Jury I.; Vnukov, Stanislav P.; and Varnin, Valentin P., 4,220,677, Cl. 427-215.000.
von der Heide, Johann, to Papst-Motoren KG. Polyphase linear motor. 4,220,899, Cl. 318-135.000.
Vorwerk & Co Interholding GmBH: *See*—
Richter, Gerhard; and Stein, Klaus, 4,220,231, Cl. 192-82.00T.
Voskresensky, Kirill D.: *See*—
Aladiev, Ivan T.; Voskresensky, Kirill D.; Gukov, Gennady P.; Saperov, Evgeny V.; and Fardzinov, Valery K., 4,220,202, Cl. 166-57.000.
Wacker-Chemie GmbH: *See*—
Dempf, Dominik; Knabl, Rudolf; Schmidhammer, Ludwig; and Mack, Wilhelm, 4,220,607, Cl. 260-652.50R.
Wafer, John A.; Hill, Robert H.; and Stephenson, William I., Jr., to Westinghouse Electric Corp. Current limiting circuit breaker with integral magnetic drive device housing and contact arm stop. 4,220,934, Cl. 335-16.000.
Wafer, John A.; and Beatty, William E., Jr., to Westinghouse Electric Corp. Current limiting circuit breaker with high speed magnetic trip device. 4,220,935, Cl. 335-38.000.
Wagatsuma, Kazuo: *See*—
Morita, Yoshiharu; Omata, Kenzo; Ohya, Junichi; Wagatsuma, Kazuo; and Shirasaka, Tadashi, 4,220,587, Cl. 260-239.100.
Wagner, Karl: *See*—
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Stemme, Otto; Wagner, Karl; Lermann, Peter; Schroder, Rolf; and Utschig, Peter, 4,220,407, Cl. 354-126.000.
Wagstaff, Robert A.: *See*—
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Wake, Robert H.: *See*—
McBride, Thomas R.; Wake, Robert H.; and McCarthy, Robert H., 4,220,863, Cl. 250-445.00T.
Waldvogel, Peter: *See*—
Bader, Rolf; Kung, Leopold; and Waldvogel, Peter, 4,220,788, Cl. 548-259.000.
Walker, Donald H. Attachable tooth cleaning agent dispenser for dental handpieces. 4,220,446, Cl. 433-85.000.
Walker, Reginald J.; and Geen, David T., to Otto Durr (Great Britain) Limited. Paint-spraying booth apparatus. 4,220,078, Cl. 98-115.0SB.
Wallace, David R., to PPG Industries, Inc. Aqueous low gloss pigmented coating compositions containing caprolactone-polyol adducts. 4,220,575, Cl. 260-29.300.
Wallace Murray Corporation: *See*—
Bremer, Robert C., Jr., 4,220,056, Cl. 74-574.000.
Walles, Wilhelm E., to Dow Chemical Company, The. Method for sulfonating organic materials. 4,220,739, Cl. 525-344.000.
Walmer, Harry E.; and Horbaly, Judd. Doll house. 4,219,960, Cl. 46-19.000.
Walser, Reimund A.: *See*—
Holan, George; and Walser, Reimund A., 4,220,591, Cl. 260-340.50R.
Walters, Roland L.; and Heitmann, Wayne R., to Abbott Laboratories. Process for making 4-aroyl-substituted phenoxyacetic acids. 4,220,801, Cl. 562-468.000.
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Wandel & Goltermann: *See*—
Harzer, Peter, 4,220,849, Cl. 235-92.0DE.
Wang, Shyh; Shah, Manhar L.; and Crow, John D., to University of California, Regents of. Polarization converter and circuit elements for use in optical waveguides. 4,220,395, Cl. 350-96.120.
Ware, Chester D.: *See*—
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Watanabe, Junko: *See*—
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Weber, Max, to Sulzer Brothers Limited. Heat exchanger system. 4,220,200, Cl. 165-142.000.
Webster, Loresta M. Tube caddy and dispenser for collapsible tubes. 4,220,260, Cl. 222-100.000.
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Wehr, Hubert; and Schlosser, Karl-Heinz, to Cyklop-Gesellschaft Emil Hoffman. Apparatus for joining the strip ends of a plastic strip. 4,220,493, Cl. 156-380.000.
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Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard. Balanced remote control. 4,221,006, Cl. 455-355.000.
Weis, Siegfried K.: *See—*
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Weisert, Edward D.; and Agrawal, Suphal P., to Rockwell International Corporation. Method for fabricating superplastically formed/diffusion bonded structures. 4,220,276, Cl. 228-118.000.
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Wempe, Richard J.; and Dumser, Paul J., to ACF Industries, Incorporated. Continuous cradle pad and skid for railway cars. 4,220,097, Cl. 105-360.000.
Wenzel, Joachim O. M. Power station. 4,220,009, Cl. 60-648.000.
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Wesson, Laurence N.; and Durkow, Carl J., to TRW Inc. Signal transducing apparatus. 4,220,943, Cl. 338-42.000.
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Whitney, Joel G.; and Hermann, Edward C., to Du Pont de Nemours, E. I., and Company. N-(Pyridothienopyrazol)amides. 4,220,776, Cl. 546-83.000.
Widehn, Ake, to ASEA Aktiebolag. Weighing scale calibrating machine. 4,220,037, Cl. 73-1.00B.
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Wiggins, Richard F., to Gyromat Corp. Part gaging control for liquid seal system. 4,220,432, Cl. 414-287.000.
Wilber, Dennis A.; and Schnapp, John P., to Cummins Engine Company. Exhaust brake modulating control system. 4,220,008, Cl. 60-602.000.
Wiles, Bradford; and Seaholm, Reuel A., to Montgomery Elevator Company. Decorative jamb structure for elevator entranceways. 4,219,979, Cl. 52-204.000.
Willach, Horst, to Huwil-Werke GmbH Mobelschloss-und Beschlagfabriken. Electrically controlled, electrically encoded push-button combination lock. 4,220,022, Cl. 70-278.000.
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Williams, David M.: *See—*
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Williams, James A., to Dana Corporation. Vehicle speed control circuit tester. 4,220,912, Cl. 324-51.000.
Willis, Kathryn E. Removable soft door for aircraft. 4,220,298, Cl. 244-129.500.
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Wristers, Harry J.; Poirot, Eugene E.; and Huff, Terrence, to Exxon Research & Engineering Co. Preparing polyolefins with a narrow particle size distribution and catalyst therefor. 4,220,555, Cl. 252-429.00B.

Wu, Chin Tao, to RCA Corporation. Encoding analog signals into digital signals using a triangular reference. 4,220,925, Cl. 328-150.000.

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Yamada, Minoru: *See*—
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Yamagiwa, Kazuo; and Numakura, Toshihiko, to Sony Corporation. Secam recording and reproducing system. 4,220,964, Cl. 358-8.000.

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Yamamoto, Takami; and Azuchi, Yukihiro, to Murata Manufacturing Co., Ltd. Trimmer capacitor. 4,220,980, Cl. 361-293.000.

Yamamoto, Yujiro. Headlamp and security alarm control system. 4,220,947, Cl. 340-63.000.

Yamanaka, Seisuke, to Sony Corporation. Signal transmission circuit. 4,220,977, Cl. 358-213.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
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Yamashita, Shuzo, to Kuraray Co., Ltd. Ethylene-vinyl alcohol membranes having improved properties and a method of producing the same. 4,220,543, Cl. 210-500.00M.

Yamashita, Yoshimasa; and Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Tuning fork mounting with damping means. 4,220,885, Cl. 310-321.000.

Yamazaki, Masami: *See*—
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Yasui, Toshio; Naito, Motoharu; and Asami, Ken, to Nippondenso Co., Ltd.; and Toycta Jidosha Kogyo Kabushiki Kaisha. Electric control circuit for safety apparatus in automotive vehicles. 4,220,871, Cl. 307-10.00R.

Yasunaga, Shigeki: *See*—
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Yates, Leonard S.: *See*—
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Yee, Kwok C.: *See*—
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Yoblin, Jack A.: *See*—
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Yokose, Toru: *See*—
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Yoshioka, Susumu: *See*—
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Young, Alastair J., to Automotive Products Limited. Servo-assisted hydraulic master cylinder. 4,220,007, Cl. 60-550.000.

Youngdale, Gilbert A., to Upjohn Company, The. Antidiabetic 1,2-dihydro-2-oxo-6-neopentyl-nicotinic acids. 4,220,648, Cl. 424-266.000.

Youngfleish, Frank C.: *See*—
Scheingold, William S.; and Youngfleish, Frank C., 4,220,383, Cl. 339-17.0CF.

Younghans, James L.: *See*—
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Jenkins, Oliver J.; and Mundinger, William D., 4,220,098, Cl. 105-378.000.

Zahir, Abdul-Cader: *See*—
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Zahir, Sheik A.: *See*—
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Zenith Radio Corporation: *See*—
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Miller, Philip C.; and Retsky, Michael W., 4,220,893, Cl. 313-450.000.

Zeppenfeld, Kurt; and Koch, Klaus D., to Krauss-Maffei. Batch centrifuge with scraper knife mounted on inlet tube. 4,220,538, Cl. 210-375.000.

Ziemek, Gerhard: *See*—
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Zimmerman, Gary L.: *See*—
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Zimmermann, Ulrich; Pilwat, Gunter; and Groves, Michael, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of and apparatus for determining the breakdown characteristics and size of membrane-sheathed particles such as cells. 4,220,916, Cl. 324-71.00R.

Zink, Henry R. Intrusion sensing device. 4,220,831, Cl. 179-110.00A.

Zubik, Maria I.: *See*—
Tokar, Vladimir A.; Zubik, Maria I.; Ternovoi, Anatoly I.; Demikhovsky, Vladimir G.; Galkin, Pavel N.; Gashenko, Stanislav I.; Rogatkin, Alexandr A.; Khlopkov, Leonid P.; Lekalova, Lidia I.; Telina, Larisa A.; and Mylenko, Yakov M., 4,220,475, Cl. 106-89.000.

Zuppinger, Paul, to Ciba-Geigy Corporation. Process for the preparation of crosslinked high polymers. 4,220,731, Cl. 521-156.000.

Zurawin, Adam; and Ricciuti, Gaetano. Paint pad assembly. 4,219,899, Cl. 15-144.00A.

Zweig, Arnold; and Hoffman, Arthur K., to American Cyanamid Company. Stabilization of resmethrin. 4,220,640, Cl. 424-175.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See—*
Liston, Max D., Re. 30,391, Cl. 356-409.000.

Ampex Corporation: *See—*
Wright, Kurt O.; and Gilligan, Thomas J., Re. 30,395, Cl. 365-130.000.

Eberhart, James G.: *See—*
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., Re. 30,392, Cl. 429-72.000.

Faist, Suzan M.: *See—*
Roche, Michael F.; Faist, Suzan M.; Eberhart, James G.; and Ross, Laurids E., Re. 30,392, Cl. 429-72.000.

Gilligan, Thomas J.: *See—*
Wright, Kurt O.; and Gilligan, Thomas J., Re. 30,395, Cl. 365-130.000.

Kupcikevicius, Vytautas; and Mika, Anton L., to Union Carbide Corporation. Stuffing apparatus. Re. 30,390, Cl. 17-49.000.

Liston, Max D., to Abbott Laboratories. Chemical analysis cuvette. Re. 30,391, Cl. 356-409.000.

Matty, Thomas C.: *See—*
Sahasrabudhe, Arun P.; and Matty, Thomas C., Re. 30,394, Cl. 333-189.000.

Mika, Anton L.: *See—*
Kupcikevicius, Vytautas; and Mika, Anton L., Re. 30,390, Cl. 17-49.000.

Mundinger, William D.; and Snyder, Richard C., to Pullman Incorporated. Railroad car with depressed floor. Re. 30,388, Cl. 410-139.000.

Oase, Vernon S., to Owens-Corning Fiberglas Corporation. Clamping apparatus. Re. 30,389, Cl. 16-87.00R.

Owens-Corning Fiberglas Corporation: *See—*
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Gombert, Jean-Marie; and Joyaux, Yves, to Airwick Industries, Inc. Fly-trap. 256,716, 9-2-80, Cl. D22-19.000.
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Hoyt, Earl, to Airwick Industries, Inc. Dispensing cap. 256,674, 9-2-80, Cl. D9-281.000.
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Lee, James C., III; and Early, Norman K. Mobile bar. 256,639, 9-2-80, Cl. D6-144.000.
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Muramatsu, Keizo. Wrist watch. 256,677, 9-2-80, Cl. D10-39.000.
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Nakao, Shinroku; Ishii, Yoshiyasu; and Matsuda, Hiroaki, to Combi Co., Ltd. Toy music box. 256,702, 9-2-80, Cl. D21-64.000.
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Utility Products Co., Inc.: *See*—
Olson, John B.; and Hickman, John S., 256,638, Cl. D6-130.000.
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Burnell, James R.: *See*—
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Cameron, Robert G.: *See*—
Ciurca, Samuel J., Jr.; Cameron, Robert G.; and Walsh, Edward J., T998,014, Cl. 548-195.000.
Osborn, Harland J.; Cameron, Robert G.; and Walsh, Edward J., T998,007, Cl. 260-556.00B.
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Stinson, John M.; and Burnell, James R., T998,001, Cl. 71-29.000.
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Higgins, Robert D., T998,004, Cl. 180-299.000.
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ISSUED SEPTEMBER 2, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

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6 :	Re.30,395		4,220,120		4,220,921		4,220,460		4,220,806		4,220,443
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	4,220,830		4,220,582	11 :	4,220,160		4,220,252		4,220,950		4,220,825
01 :	4,219,896		4,220,630		4,220,461		4,220,284		4,220,955		4,220,872
	4,220,209		4,220,757		4,221,005		4,220,293	20 :	4,219,992		4,220,920
	4,220,253		4,220,804	12 :	4,219,961		4,220,300		4,220,178		4,220,929
	4,220,535		4,220,813		4,219,967		4,220,330		4,220,211		4,220,959
04 :	4,220,439		4,220,814		4,220,071		4,220,342		4,220,239		4,220,988
	4,220,478		4,220,831		4,220,151		4,220,359		4,220,466	26 :	4,219,902
	4,220,666		4,220,848		4,220,198		4,220,391		4,220,721		4,219,903
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	4,220,993		4,220,857		4,220,306		4,220,445	21 :	4,219,969		4,220,053
05 :	4,220,429		4,220,866		4,220,333		4,220,485		4,219,978		4,220,136
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	4,219,900		4,220,906		4,220,366		4,220,525	22 :	4,219,971		4,220,143
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